Prisma Optics Training Module 1 v3

Provided by: Mega Hertz 800-883-8839 info@go2mhz.com www.go2mhz.com

V3 added 1310 & OBand

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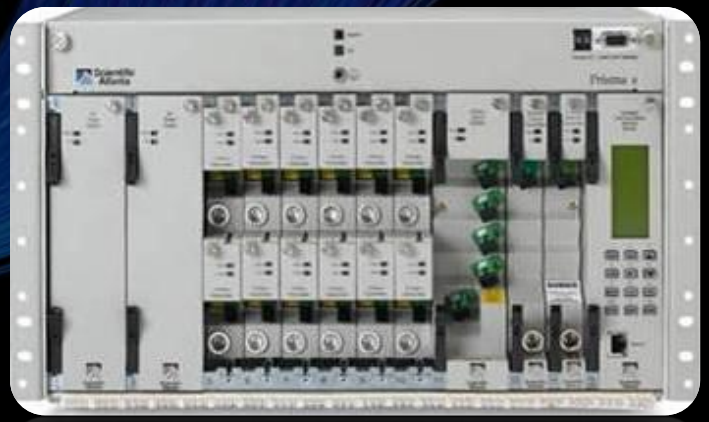
Agenda

- Product Overview, products used in overlay
  - Prisma II & XD Chassis
  - Configuration and monitoring options
  - 1550 Broadcast TX
  - 1550 DWDM S-QAM TX
  - 1550 DWDM S-QAM-FS TX
  - 1310 & O-Band Multiwave TX
  - Prisma EDFAs



Prisma Chassis

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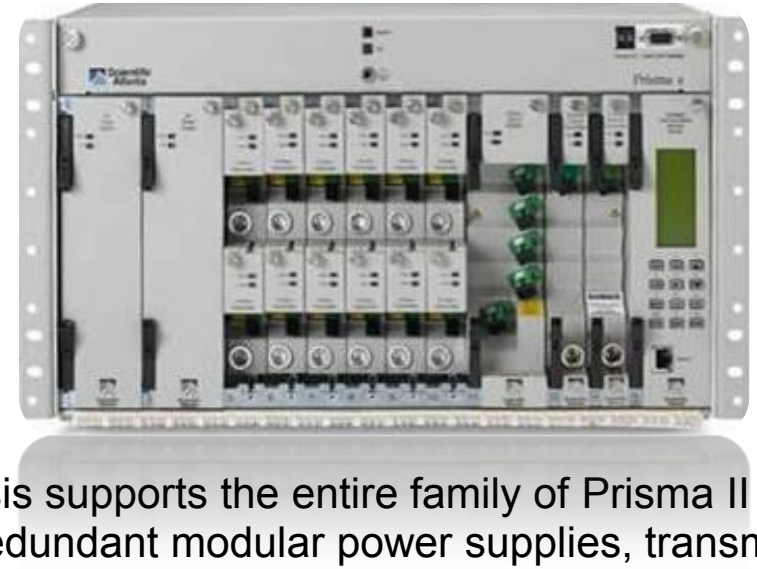
Prisma II Chassis

- The Prisma II Chassis accommodates up to 13 single-slot modules. This is in addition to the primary power supply. When an ICIM is installed (using two slots), the number of available slots drops to 11. When both an ICIM and a redundant (second) power supply (using two slots) are installed, the chassis accommodates 10 single-slot modules.



- The Prisma II Chassis supports the entire family of Prisma II modules including ICIM, primary and redundant modular power supplies, transmitters, and receivers. The chassis also supports RF driver amplifiers, externally modulated transmitters, optical switches, and digital reverse TX/RX modules.

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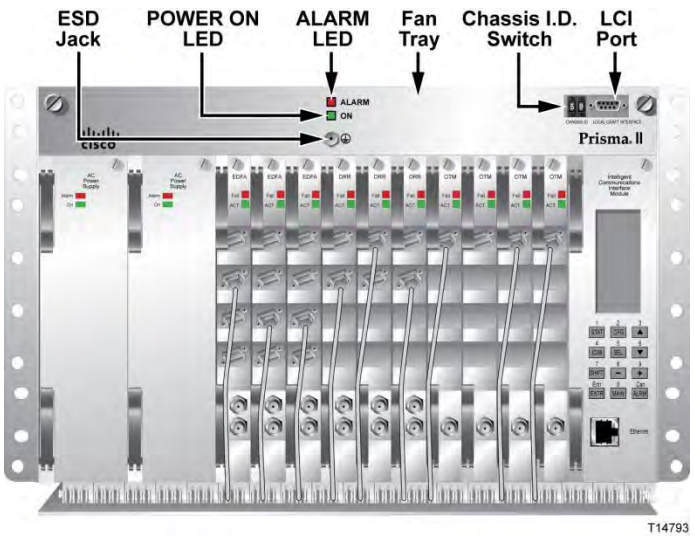
Chassis Front Panel

Depending on your system requirements, the chassis is factory configured as either:

- Front access, with port and power connectors on the lower part of the front panel.
- Rear access, with port and power connectors on the back of the unit.

736762	144869	(P2-CH-R-F-56-R-AAS)Chassis,Rear Acc,56F,2/AC Pwr
736766	144870	(P2-CH-R-F-56-R-DDS)Chassis,Rear Acc,56F,2/-48VDC Pwr



Part	Description
Power **ON** LED	Illuminates when power is applied to the chassis.
ALARM LED	Illuminates if there is a failure in the chassis cooling fan tray.
LOCAL CRAFT INTERFACE (LCI) Port	Used to connect a PC to the chassis for module setup when no ICIM is installed.
CHASSIS ID Switch	Allows the operator to assign an identification number to every Prisma II Chassis for addressing by ICIM, LCI, or TNCS software. When using the ICIM, this number is referred to as the shelf number. Each chassis connected to an individual ICIM must have a unique chassis ID number.
Electrostatic Discharge (ESD) Jack	Used prior to touching any modules.

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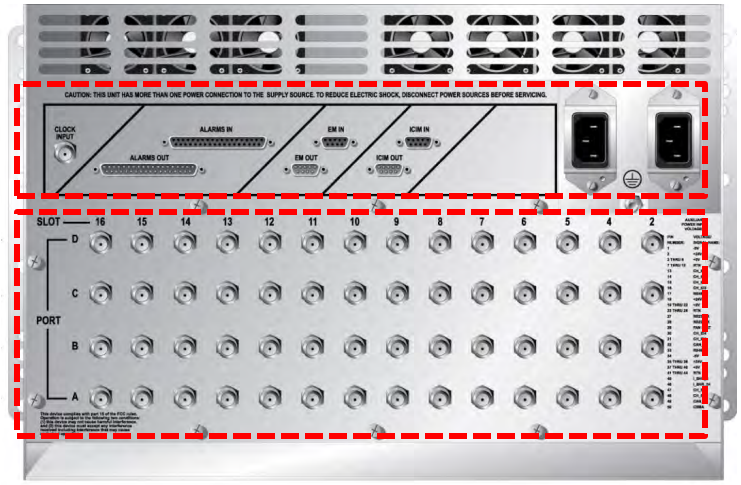
Chassis Connections

Connector Interface Panel

- The connector interface panel houses the electrical, signal, and alarm connectors, as well as the power inlets required for chassis operation.

Chassis Inputs and Outputs

- Chassis inputs and outputs consist of cable assemblies that connect the backplane to ALARMS IN, ALARMS OUT, EM IN, EM OUT, ICIM IN, ICIM OUT, CLOCK INPUT, RF IN, RF OUT and the Ground Stud.


CAUTION: THIS UNIT HAS MORE THAN ONE POWER CONNECTION TO THE SUPPLY SOURCE. TO REDUCE ELECTRIC SHOCK, DISCONNECT POWER SOURCES BEFORE SERVICING.
CLOCK INPUT
ALARMS IN
ALARMS OUT
EM IN
EM OUT
ICIM IN
ICIM OUT
SLOT 16 15 14 13 12 11 10 9 8 7 6 5 4 2
PORT
D
C
B
A
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Chassis Inputs & Outputs

EM IN/EM OUT

- The EM IN and EM OUT connectors on the connector interface panel are used to allow TNCS element management software to control and monitor more than one chassis.

ALARMS IN/ALARMS OUT

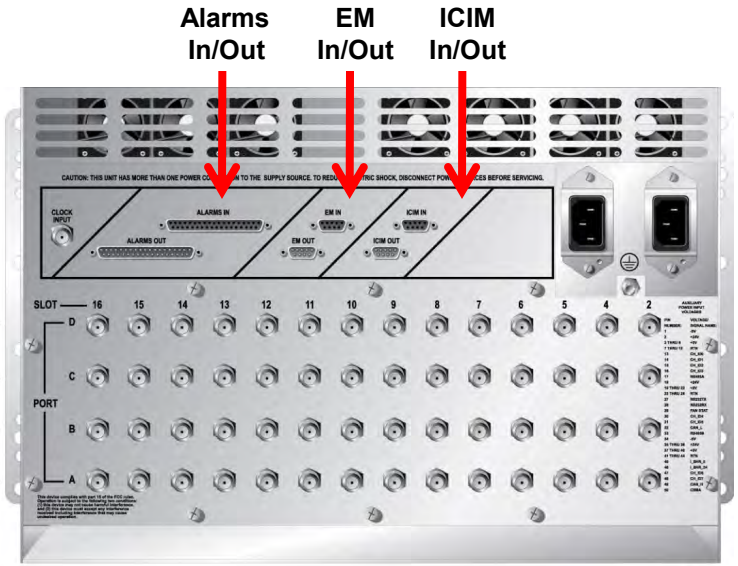
- These connectors allow for an ALARM OUT ALARM IN for each module slot in the chassis.

ICIM IN/ICIM OUT

- These connectors allow one ICIM to control and monitor modules in more than one chassis.

RF Input Output Ports

- These connections allow RF connectivity to chassis backplane feeding modules



Power Supply Inlets

- The primary and secondary power supplies are inserted from the front of the chassis. The power supply connectors mate with the factory-installed power inlet connectors on the backplane. The inlets differ according to which type of power supply is installed. Either AC or DC supplies can be installed in the chassis when the proper power inlets are installed

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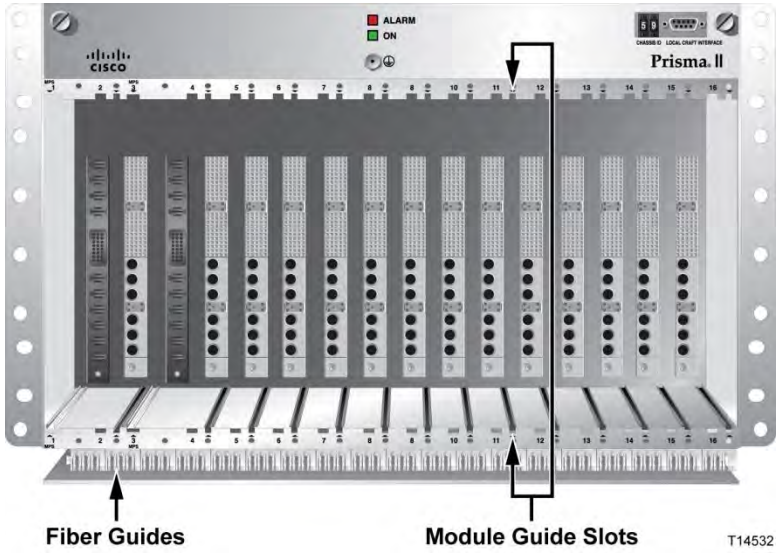
Chassis Backplane

- The chassis backplane consists of the inside and the outside rear panel of the chassis through which the electrical and communication signals are connected and distributed. In addition to distributing electrical power and providing a common serial bus, the backplane also connects 4 RF ports (2 connectors are standard, 2 others are optional) to each of the 14 module connectors.
- Module connectors inside the chassis accommodate electrical power, digital signals, and analog signals. The connectors are inherently self-guiding and allow a blind mate connection.



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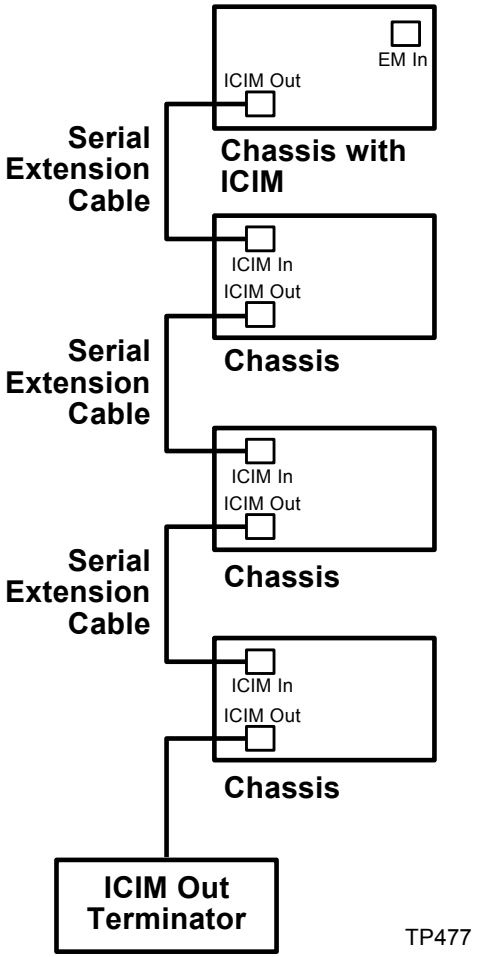
Connecting the ICIM to Additional Chassis

Chassis-to-Chassis ICIM Connections

- The Prisma II platform allows the ICIM to be located in one chassis and control modules located in several other chassis. This communication “daisy-chain” can be enabled by connecting cables to the **ICIM IN** and **ICIM OUT**. This connection is required if an ICIM in one chassis is to communicate with or control any module located in a separate chassis.
- **Note:** An ICIM can control up to 140 modules 6 to 7 chassis, typical deployment 3 to 4 chassis per ICIM.



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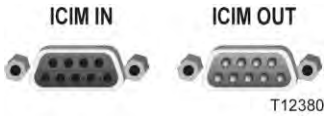
Connecting the ICIM to Additional Chassis

ICIM IN and ICIM OUT Connectors



- Every chassis has a DB9 **ICIM IN** and a DB9 **ICIM OUT** connector for the purpose of chassis-to-chassis ICIM2 connections. **ICIM IN** is a female connector and **ICIM OUT** is a male connector.
- The cable required for both **ICIM IN** and **ICIM OUT** connections is a shielded 9-wire serial extension cable, DB9 Female to DB9 Male. Cisco # 180143 CIFA# 144856
- All chassis connected in this daisy-chain must have a unique chassis ID number.
- If the **ICIM OUT** terminator (4013014) that ships with the ICIM is not installed on the last chassis of a daisy-chain connection, faulty communication with the ICIM may occur.
- The ICIM OUT port of the last chassis in the daisy-chain must be terminated with an ICIM OUT terminator, part number 4013014

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External Alarms Connections

Master/Slave Operation

- All Prisma II modules ship from the factory configured as a master. The LCI, TNCS software, or the ICIM can be used to reconfigure a module as a slave or as redundant (slave).
- The Chassis allows for local hard-wired redundancy by using the **ALARM IN** and **ALARM OUT** connectors. A pair of modules can be configured so that if the master fails, the slave takes over by using the **ALARM IN** and **ALARM OUT** connectors

ALARM IN and ALARM OUT Connectors

- The Prisma II Chassis provides two connectors for external alarms to and from each module slot. These alarm connectors are located in two 37-pin D-connectors (DB-37) and are labeled **ALARM IN** and **ALARM OUT**.
  - **NOTE:** Master Slave feature requires Redundancy Interface Panel (RIP). The RIP serves as an extension to the two DB-37 connectors labeled **ALARM IN** and **ALARM OUT** – see IO Guide for further details

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Power Supply

- There are two versions of the Prisma II Power Supply, AC or DC. The type that you use depends on the input voltage to your system.
- The two versions are functionally identical, and differ only in cable connections to chassis and input voltages.
  - AC Supply Cisco 4012765 CIFA 16365
  - Voltage requirements 90 to 265 VAC
  - DC Supply Cisco 716312.001.000.BA, CIFA 145084
  - Voltage requirements -40 to -75 VDC

Front Panel Indicators

- The front panel of the power supply has a green **ON** indicator and a red **ALARM** indicator. The **ON** indicator illuminates when external power has been applied. The **ALARM** indicator illuminates when the power supply has a problem supplying one of the required output voltages to power the chassis.

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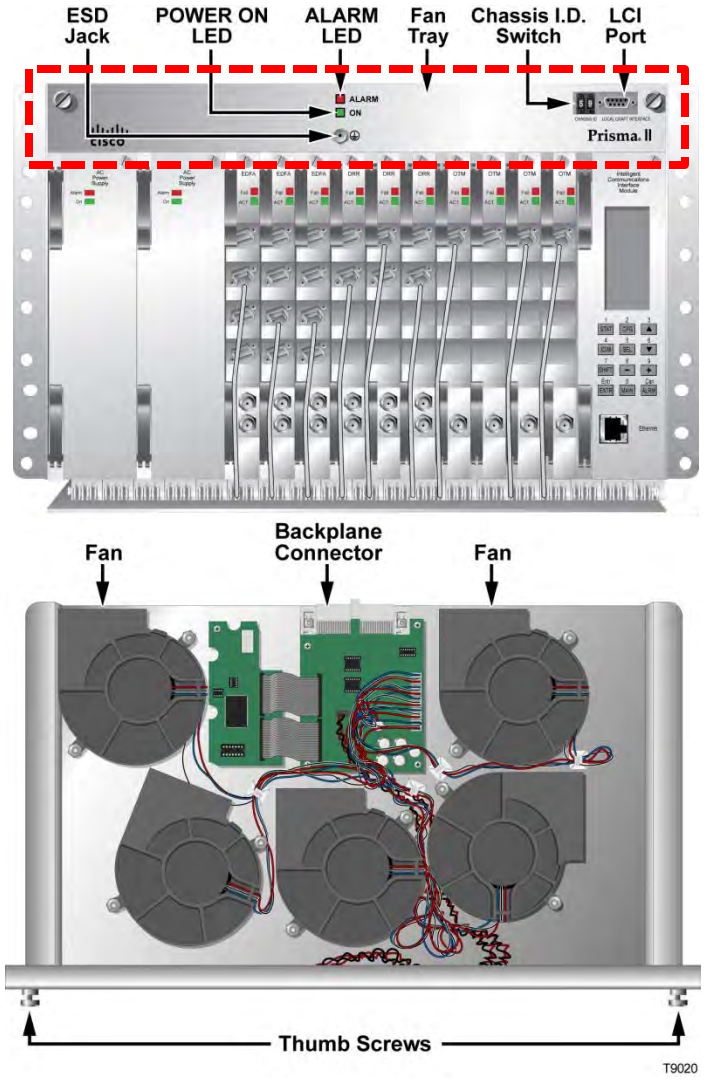
Fan Tray

- The Prisma II Fan Tray provides cooling to the Prisma II Chassis and monitors the Prisma II Power Supplies.
- The fan tray is installed in the top of the Prisma II Chassis at the factory. It can be removed for maintenance or inspection by loosening the two screws located on either side of the front panel.
- **Important**: Do not operate Chassis without a fan tray installed. If a fan tray is not installed in the chassis, the ICIM will not communicate with any of the modules in that chassis
  - Fan Tray replacement # 741419
  - Fan Kit, fans only # 741421



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PII ICIM2 Front Panel

Part	Function
LCD screen	Displays the ICIM2 menus, alarms, and status information.
12-key numeric keypad	Used to navigate the ICIM2 menus and configure the application modules.
Ethernet connector	Directly connects the ICIM2 to an IP network. The ICIM2 Ethernet port is suitable for connection to intra-building wiring, non-exposed wiring or cabling only.
Yellow LED on Ethernet connector	Glows when the Ethernet port is operating in full duplex. Blinks when collisions occur on the Ethernet port.
Green LED on Ethernet connector	Glows when a link is established on the Ethernet port. Blinks during data activity on the Ethernet port.
RS232 connector Old pic, RS232 not shown	Used to connect a PC to the Prisma II system for CLI communication and setup.

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Checking the Operating Status using the ICIM2

You can use the ICIM to check status of all operating parameters of a module. All status information is displayed on the ICIM LCD.

1 At the MAIN menu, press the ▼ key to highlight the **Shelf** and **Slot** fields.

2 Press the SEL key to address the **Shelf** number. Then press the + key or the − key to scroll to the number of the desired shelf.

3 Press the ENTER key. The **Slot** field is highlighted.

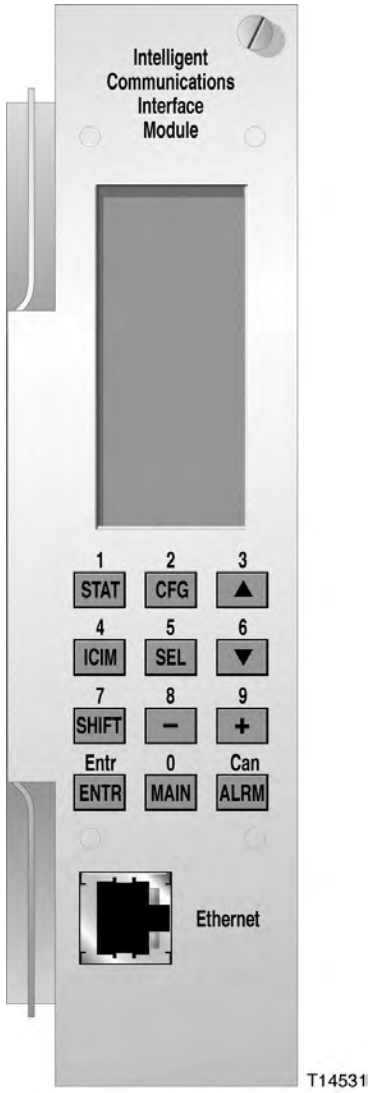
4 Press the + key or the − key to scroll to the number of the desired slot.

5 Press the ENTER key. The **MODULE** menu appears on the ICIM LCD.

6 Press the STAT key.

7 Press the ▲ key or the ▼ key to scroll through the monitored parameters until you find the parameter of interest.

8 Check the status of the desired parameter or select other parameters to monitor. When finished, press the MAIN key to return to the **MAIN** menu



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Prisma XD Chassis

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Prisma II XD Platform

- The Prisma II XD Platform is a configurable and expandable system for providing transmit and receive functions to fiber-optic communications networks.

The Prisma II XD Platform consists of the following products.

- Prisma II XD Chassis # 4022058 CIFA 63436 Chassis NO ICIM, # 4023768 CIFA 63437 Chassis with ICIM
- Prisma II XD fan assembly
- Prisma II XD AC-to-DC bulk power supply modules (one or two) #1005444
- Prisma II ICIM2-XD Intelligent Communications Interface Module #4022060
- Prisma II High-Density application modules
- Prisma II XD Chassis application module blanking panels
- http://www.cisco.com/en/US/products/ps8863/index.html

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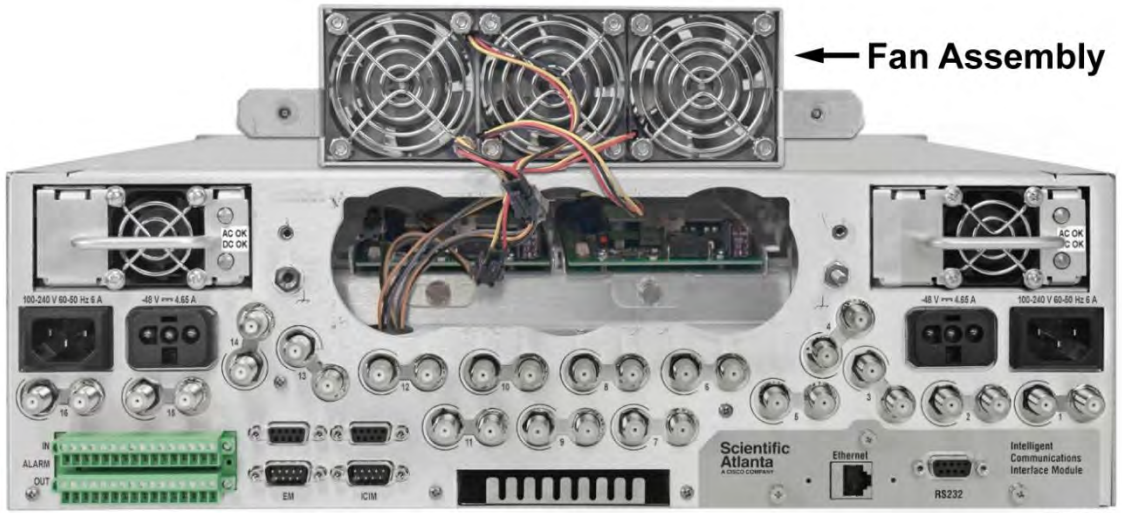
XD Fan Assembly

- The chassis uses a negative pressure fan system to pull cooling air from the ambient environment. Three fans are housed in a field-replaceable assembly attached at the back of the chassis.
- The fan assembly can be removed for inspection and maintenance, to provide access to the DC-to-DC converters inside the chassis, or to remove either of the AC-to-DC bulk power supply modules.



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Chassis Power Supply Architecture

- The chassis can operate from utility AC power or from external -48 VDC power.
- For AC operation, one or two AC-to-DC bulk power supply modules are installed in the chassis. Each of these modules supplies -48 VDC power to one of two DC-to-DC converter assemblies inside the chassis
- For DC operation, one or both AC-to-DC bulk power supply modules are removed, and power for one or both internal DC-to-DC converter assemblies is supplied from external -48 VDC power source.
- The DC power connector can serve one of two functions, depending on the power supply configuration:
  - ✓When the associated AC-to-DC bulk power supply slot is empty, its DC power connector acts as an inlet for external -48 VDC.
  - ✓When the associated AC-to-DC bulk power supply slot is populated, its DC power connector acts as an outlet for -48 VDC from the bulk power supply module.

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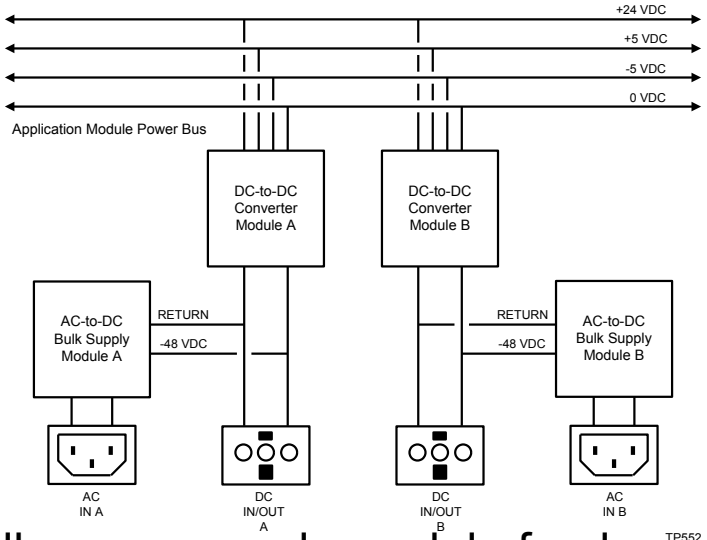
Chassis Power Supply Architecture

- The following diagram shows the general power supply architecture for a single Prisma II XD Platform chassis.



- Each AC-to-DC bulk power supply module feeds a separate, dedicated DC-to-DC converter assembly. The chassis ships with two DC-to-DC converters installed, but without either AC-to-DC bulk power supply module installed.
- Each DC-to-DC converter can power a full chassis on its own. The use of dual independent converters, together with dual AC-to-DC bulk power supplies, allows for full power supply redundancy.

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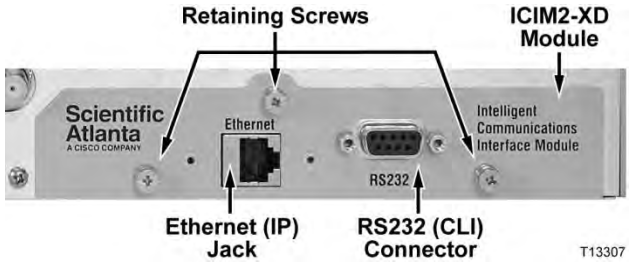
ICIM2-XD



- The ICIM2-XD provides users with access to application module configuration settings, status monitoring, and alarm monitoring.
- The ICIM2-XD is logically identical to the ICIM2 module used in Prisma II chassis. However, the ICIM2-XD is physically smaller than the ICIM2 and lacks a front-panel keypad or liquid-crystal display.

Part	Function
Ethernet connector	Directly connects the ICIM2-XD to an IP network. The front-panel Ethernet port is suitable for connection to intra-building wiring, non-exposed wiring or cabling only.
RS232 connector	Used to connect a co-located PC to the Prisma II Enhanced system for local console port CLI communication and setup.

- **Note:** When a Prisma II chassis and a Prisma II XD chassis are part of a daisy-chain connection of two or more chassis, a single ICIM2 or ICIM2-XD can and must be used to control both chassis.

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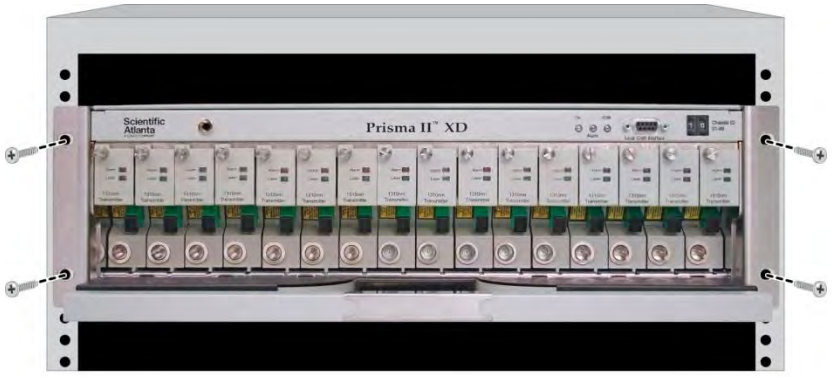
Step 1: Install Chassis in a Rack

(Just in case you have never installed a piece of equipment in a rack) ☺

1. Use a torque wrench to tighten the bracket mounting screws to 12 to 14 in-lbs
2. Position the chassis in the rack with the fan assembly installed, but otherwise empty.
3. Insert a mounting screw through each of the four mounting holes on chassis front panel, and then into the rack.



T13303

4. Use a medium-sized Phillips-head screwdriver to tighten each mounting screw until it is tight.
5. Install additional cable and fiber management hardware as needed and in accordance with local practice.

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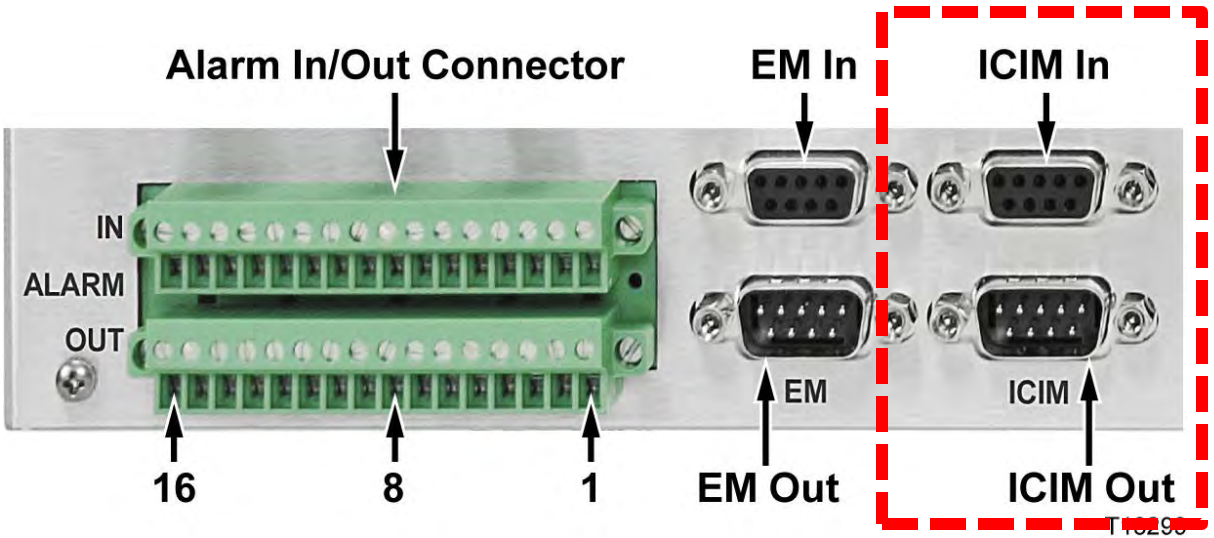
Step 2: ICIM In ICIM Out Cable Connections

Chassis-to-Chassis ICIM Connections

- The Prisma II XD platform allows the ICIM2-XD to be located in one chassis and monitor application modules in other chassis. This communication “daisy-chain” can be enabled by connecting cables to the **ICIM IN** and **ICIM OUT** connectors on the chassis interface panel.



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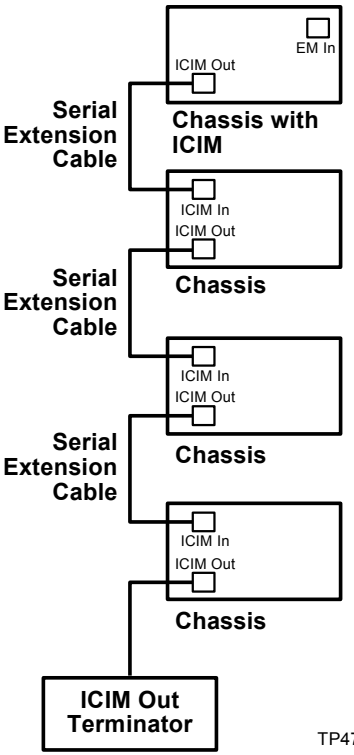
Step 2: ICIM In ICIM Out Cable Connections

1. Connect the serial extension cable (CIFA 144856) from the **ICIM OUT** of the chassis containing the ICIM2-XD to the **ICIM IN** connector of the second chassis.
2. Connect a serial extension cable from the **ICIM OUT** of the second chassis to the **ICIM IN** of the third chassis, if installed, third chassis to fourth etc.
3. Change the chassis ID numbers as needed to give each chassis an appropriate unique ID number. See **To Change the Chassis ID Number** below for further details and cautions.
4. The ICIM OUT port of the last chassis in the daisy-chain must be terminated with an ICIM OUT terminator, part number 4013014, which ships with the ICIM2-XD.



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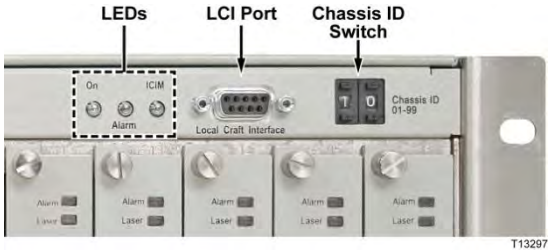
Step 2: Change Chassis ID Number

1. Locate the chassis ID switch at upper right on the front panel of each chassis. The switch can be set to any two-digit value from 00 to 99 (but avoid setting the value to 00, as explained below).
2. Use the chassis ID switch to set each chassis ID number to a unique value.



Note:

- The chassis ID number can be changed while the chassis is under power. However, the new ID number will not become effective until chassis power is cycled or the ICIM2-XD is rebooted.
- The chassis numbering scheme used is discretionary, except that each interconnected chassis must have a unique ID number.

CAUTION:

Setting the chassis ID to 00 is not recommended as it causes the entity MIB to violate RFC-2737 by creating an invalid object identifier. This may affect operation with some management systems that use the entity MIB. In particular, attempts to access the fans (in virtual slot 0) in chassis 00 will fail if made via serial TNCS (or ROSA-EM) or LCI.

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Step 3: Make Electrical Connections

The chassis back panel has an IEC standard AC power inlet and a three-conductor DC power connector for each bulk DC power supply module slot.

- The AC power inlet accepts line voltage at 100 to 240 VAC, 50 or 60 Hz.
- The DC power connector accepts DC input voltage at -40 to -72 VDC (-48 VDC nominal).
- The power connectors on the left side of the chassis supply power to the left power supply slot, while those on the right supply power to the right power supply slot.

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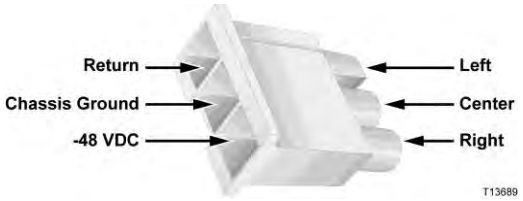
Step 3: Make Electrical Connections ~ DC Power Systems

- External -48 VDC operating power for each DC-to-DC converter (mounted in the chassis just behind the fan assembly) enters the chassis via a dedicated DC power inlet mounted on the chassis back panel.
- The voltage input range for DC power systems is -40 VDC to -72 VDC.
- Use cable 4011730 for DC wiring. The #16 AWG wiring from the external -48 VDC supply is attached to a 3-pin nylon connector which, in turn, plugs into the DC power inlet.
- Order additional nylon plugs and connector pins from your preferred supplier, as follows:
  - Molex #03-12-1036 nylon 3-pin connector
  - Molex #18-12-1222 crimp socket contact (3)



- Use a Molex Crimp Service Tool #63811-1000 or equivalent to crimp the pins to the cable.

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Step 4: Install the ICIM2

Note: Chassis can be ordered with or without ICIM ~ follow steps if adding ICIM to non ICIM chassis

1. Remove the blanking panel covering the ICIM slot in the lower right corner of the chassis back panel.
2. Hold the ICIM2-XD so that the front panel silkscreen is in correct reading position.
3. Align the two ridges on the bottom of the ICIM2-XD with the module guide slots located in the chassis.

4. Gently slide the ICIM2-XD into the chassis until its power and communications connections join connectors on the back plane bus and its front panel rests against the chassis.
5. Tighten the retaining screws on either side of the ICIM2-XD to secure to chassis

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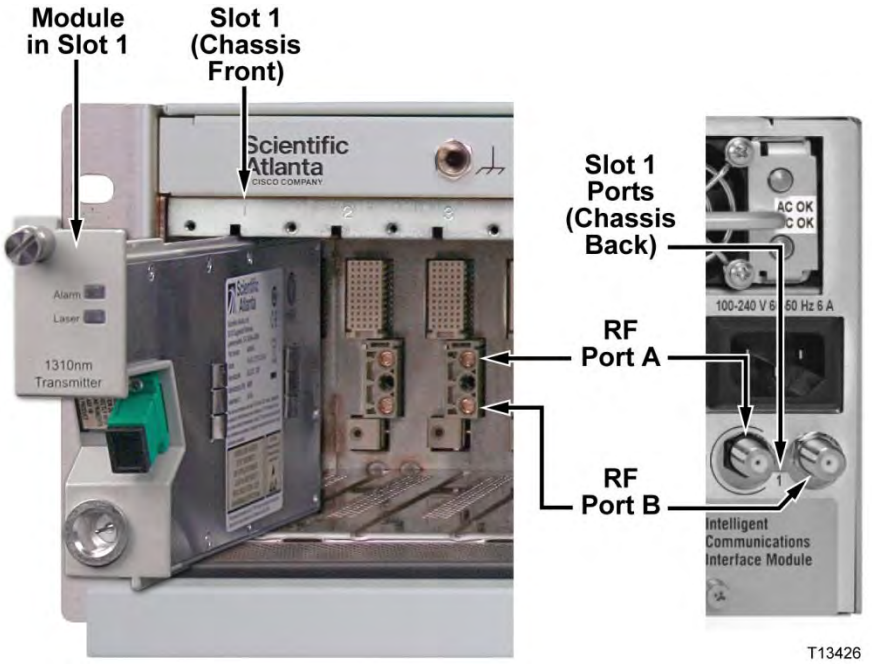
Connecting RF Cables

- The chassis back panel has two RF connectors, A and B, for each application module slot. Each pair of RF connectors is numbered (1-16) to show its corresponding slot number. RF port A, leftmost in each pair, is marked by a black semicircle or nut at the base of the connector. RF port A provides connection to the upper of two independent RF channels on the chassis midplane, while RF port B provides connection to the lower RF channel.



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Equipment Configuration

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Equipment Configuration

- There are several different ways to configure the equipment.
  - Command line interface (CLI)
  - ICIM2 Web Interface
  - ICIM2 keypad (PII chassis only)
  - Simple Network Management Protocol (SNMP)
  - Local Craft Interface (LCI)
- This section we will cover LCI & ICIM2 Wed Interface
- For further information on configuration using the CLI, see the *Prisma II Platform Remote User Interface Guide*, part number 4012441.

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Equipment Configuration Local Craft Interface (LCI)

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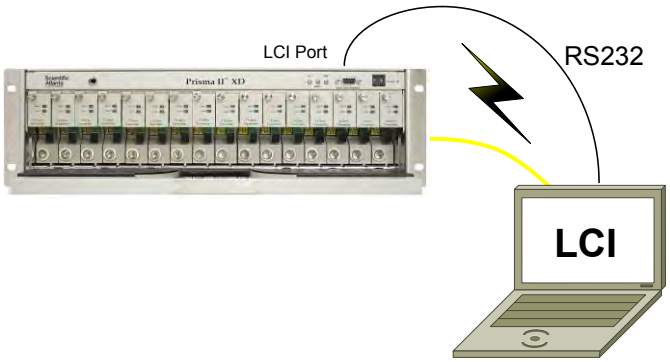
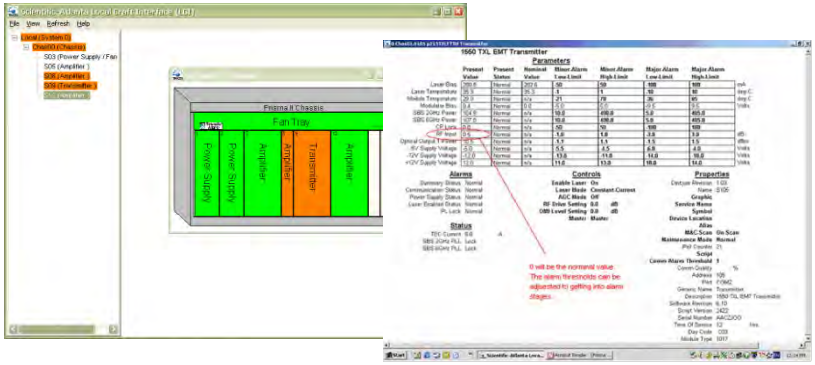
Local Craft Interface (LCI)



- The Local Craft Interface is a DB9F connector found on the front of each and every Prisma II and XD chassis. This serial port is addressed via a terminal type program that can be run on a laptop or other PC. A serial cable is connected to this port and the serial port of the PC. The application can poll all the hardware in the rack returning current configuration and alarm information
- Serial cable can be purchased locally or ordered from the factory part number 180143.

- The first display represents the chassis and contained hardware. Drill down via the tree view or “double click” on a module opens the device control screen.
- Second display
  1. All gain settings
  2. All alarm settings
  3. Software and firmware versions
  4. Serial number
  5. Address information
  6. Module type
  7. Equipment status



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LCI Function

LCI is software that functions as a user interface for the Prisma II & XD platform. LCI is installed on a computer, which is then connected to a Prisma Chassis. Using LCI, you can configure and monitor the modules in the chassis to which the computer is connected.

System Requirements

You will need the following computer software and hardware to run LCI.

Computer Requirements

- Pentium II 300 MHz processor or equivalent
- 128 MB RAM
- 10 MB available hard drive space
- Windows 95 or later operating system software

Cable Requirements

The required cable is a standard serial extension cable, DB9 Female to DB9 Male. This cable can be purchased locally or ordered from the factory as part number 180143. The connectors are a serial 9-pin D-shell (EIA 574/232).

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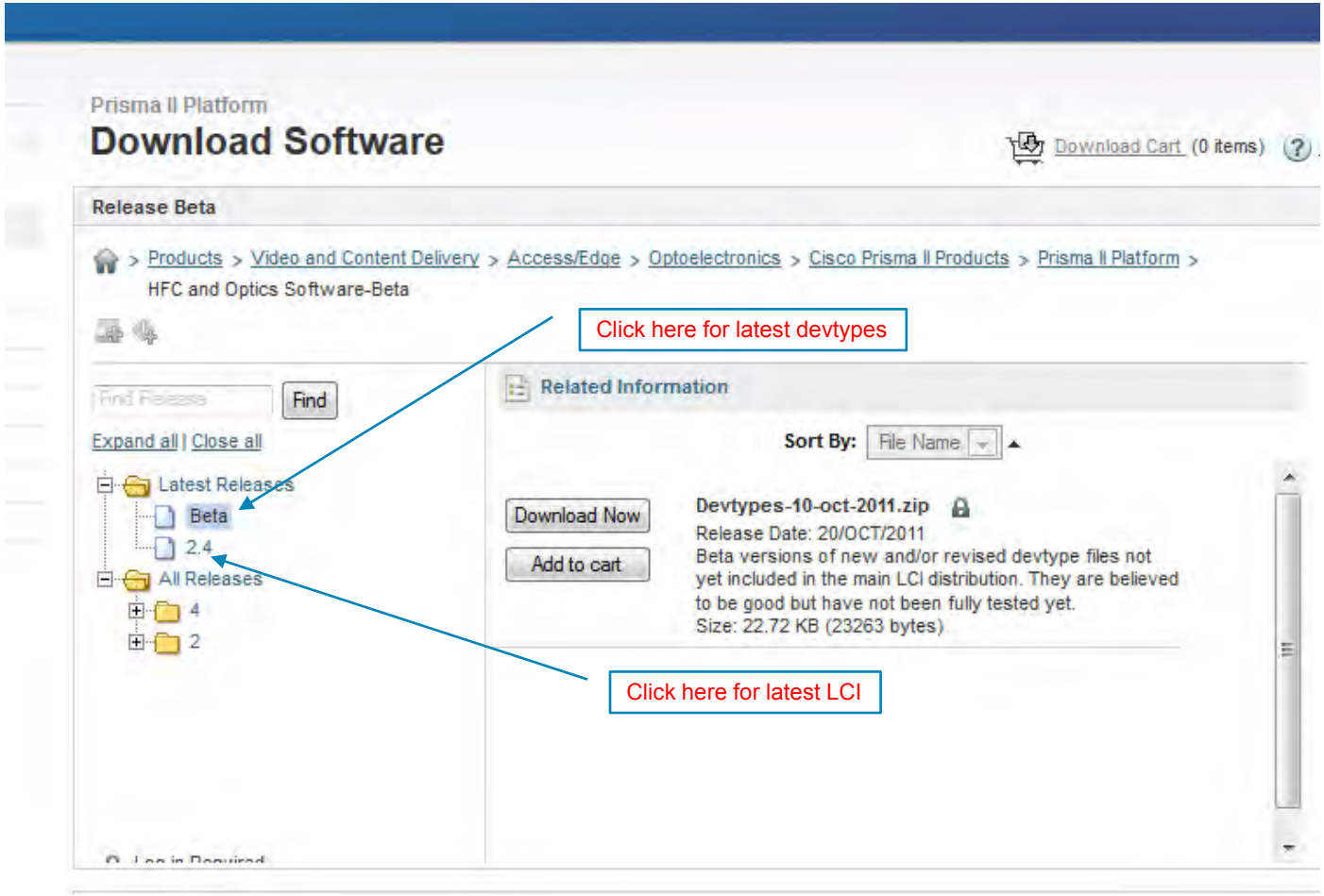
Installing LCI

- You can go to Cisco.com -> Support and search for Prisma II. Click on “Prisma II Platform” and then “HFC and Optics Software” to get here:


Prisma II Platform
Download Software
Download Cart (0 items)
Release Beta
Products > Video and Content Delivery > Access/Edge > Optoelectronics > Cisco Prisma II Products > Prisma II Platform >
HFC and Optics Software-Beta
Click here for latest devtypes
Find
Expand all | Close all
Latest Releases
Beta
2.4
All Releases
4
2
Related Information
Sort By: File Name
Download Now
Add to cart
Devtypes-10-oct-2011.zip
Release Date: 20/OCT/2011
Beta versions of new and/or revised devtype files not yet included in the main LCI distribution. They are believed to be good but have not been fully tested yet.
Size: 22.72 KB (23263 bytes)
Click here for latest LCI

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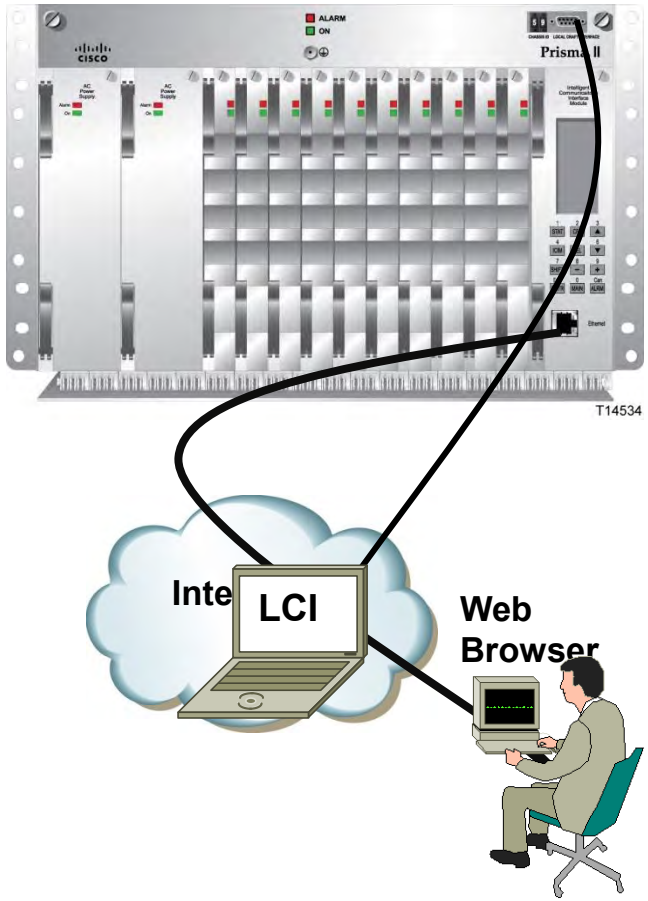
Connecting Your Computer to the Chassis

- Before you start LCI, you must first connect your computer to the chassis that contains the module(s) you want to check.
- LCI only communicates with modules installed in the chassis to which your computer is connected. To check other modules, you must connect your computer to the chassis in which they are installed.
- If LCI does not communicate with a module in the chassis to which your computer is connected, it may be necessary to update the LCI application.

  Latest rev as of 8.25.11 is 2.4.4



To Connect a Computer to the Chassis

1. Plug one end of a 9-pin RS-232 serial extension cable into your computer.
2. Plug the other end of the cable into the LCI port, labeled **Local Craft Interface**

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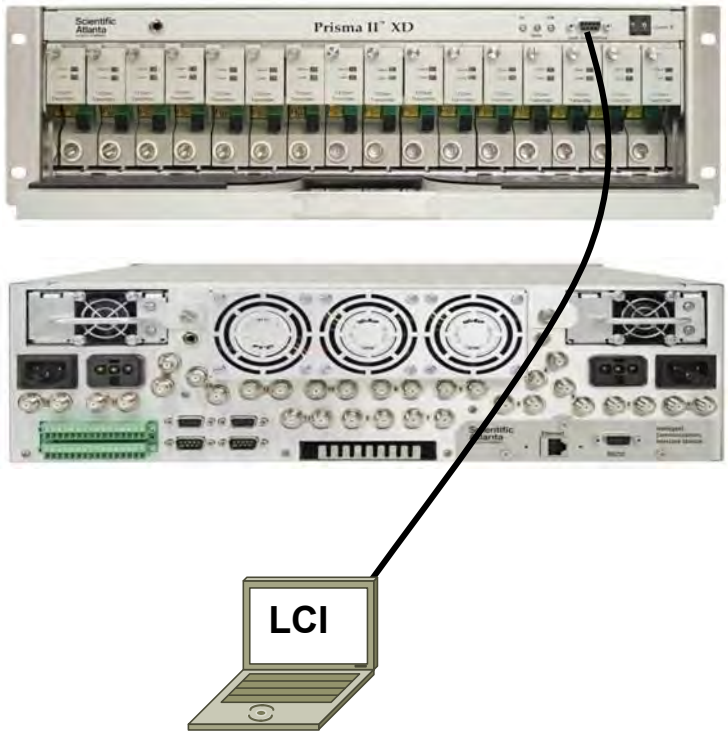

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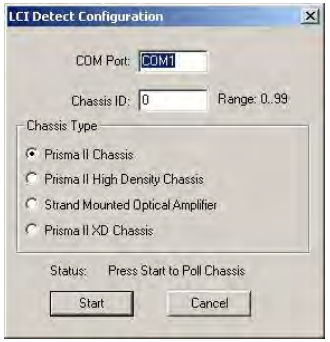
Starting LCI Software

1. Double-click the LCI icon on your Windows desktop

Result The LCI Detect Configuration window appears as shown below



2. In the LCI Detect Configuration window, select the appropriate COM port, chassis ID, and chassis type, and then click **Start**.

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Equipment Configuration Web Interface

David Kirkpatrick
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Intelligent Communications Interface Module

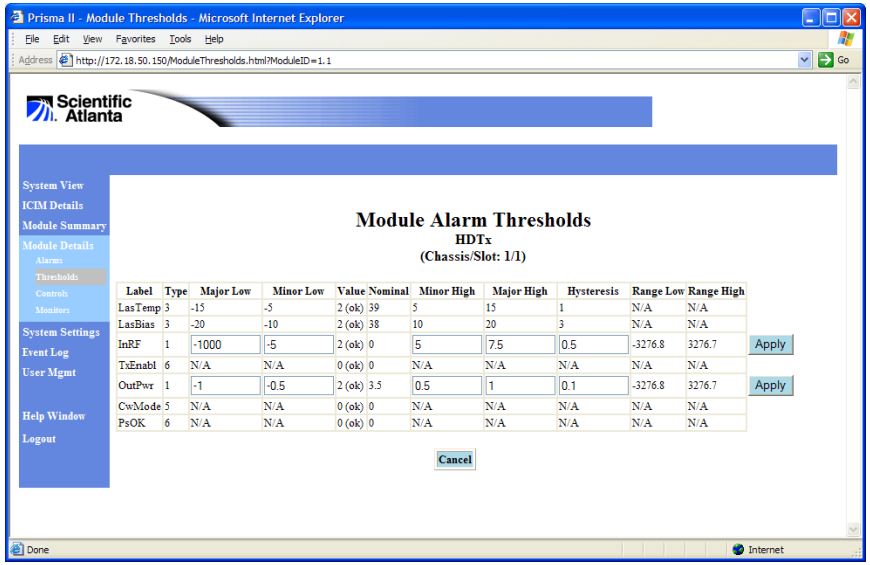
The XD ICIM2 provides an interface to Prisma platform application modules via command line interface (CLI), Web Browser or SNMP

- The ICIM can support multiple chassis in a daisy-chain connection

- ICIM Web Interface

  Remote Access – allows access to the Web User Interface via a Mozilla (Unix) or Internet Explorer 6.0 (Windows) Browsers

- Via the ICIM Web Interface you can access the following
  - ✓ ICIM Data
  - ✓Module Data
  - ✓Current Alarms
  - ✓Module Alarms
  - ✓Module Control
  - ✓Module Monitors
  - ✓System Information
  - ✓User Management


Prisma II - Module Thresholds - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://172.18.50.150/ModuleThresholds.html?ModuleID=1.1
Go
Scientific Atlanta
System View
ICIM Details
Module Summary
Module Details
Alarms
Thresholds
Controls
Monitors
System Settings
Event Log
User Mgmt
Help Window
Logout
Module Alarm Thresholds
HDTx
(Chassis/Slot: 1/1)
Label Type Major Low Minor Low Value Nominal Minor High Major High Hysteresis Range Low Range High
LasTemp 3 -15 -5 2 (ok) 39 5 15 1 N/A N/A
LasBias 3 -20 -10 2 (ok) 38 10 20 3 N/A N/A
InRF 1 -1000 -5 2 (ok) 0 5 7.5 0.5 -3276.8 3276.7 Apply
TxEnabl 6 N/A N/A 0 (ok) 0 N/A N/A N/A N/A N/A
OutPwr 1 -1 -0.5 2 (ok) 3.5 0.5 1 0.1 -3276.8 3276.7 Apply
CwMode 5 N/A N/A 0 (ok) 0 N/A N/A N/A N/A N/A
PsOK 6 N/A N/A 0 (ok) 0 N/A N/A N/A N/A N/A
Cancel
Done
Internet

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Web Interface

Introduction

- The ICIM Web Interface is a set of HTML pages hosted by the web server in the ICIM2 and ICIM2-XD. These pages display information about the ICIM2 and other modules in its domain.
- You navigate and interact with the Web Interface through the use of menus and hyperlinks, just as with a typical web site
- The Web Interface provides a subset of CLI functionality using SNMP as the underlying communication protocol. However, using the Web Interface requires no knowledge of either SNMP or CLI.

Note: For these pages to work properly, both JavaScript and cookies must be enabled in your web browser.

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Web Browsers Supported

- Mozilla for Unix or Linux, version 1.7
- Microsoft Internet Explorer for Windows, version 6

CAUTION:

Before closing the browser or tab in which the Web Interface session is running, be sure to log out of the Web Interface using the Logout link at the bottom left of the navigation pane.

If you close the browser or tab before logging out, the session will hang open for the duration of a timeout interval. This may prevent access to the ICIM2 through either the CLI or the Web Interface by you or other users. This may also create a breach of security by enabling unauthorized users to access the Web Interface at the previous user authorization level by opening a new browser tab.

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Information Color Code

- Items shown in red signal conditions that require prompt user attention.
- Items shown in blue are links to pages with more details.
- Items shown in black signal normal conditions or values falling within nominal limits.

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Installation

- The Web Interface is already resident in the ICIM2 firmware. All that is needed for access is to install an appropriate web browser and point it to the ICIM2 IP address. Your system administrator can provide the IP address for this page in your installation.

To Install the Web Interface for Windows

- To download the instructions for installing Internet Explorer 6 for Windows, use your current browser to access the links for installation provided at http://www.microsoft.com.

To Install the Web Interface in Solaris

- To download the instructions for installing Mozilla 1.7 on Sparc Workstations (Solaris 8 and 9), use your current browser to access the links for installation provided at http://www.mozilla.org.

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Login and Logout

To use the Web Interface, you must enter a valid user name and password. The default user name and password are given below.

- User name: **Administrat0r**
- Password: **AdminPassw0rd**

Note:

- Both the default user name and the default password have a zero (0) in place of the expected "o" character.
- For security reasons, it is recommended that the default user name be changed immediately. For additional information, see **User Management** in the appropriate system guide.

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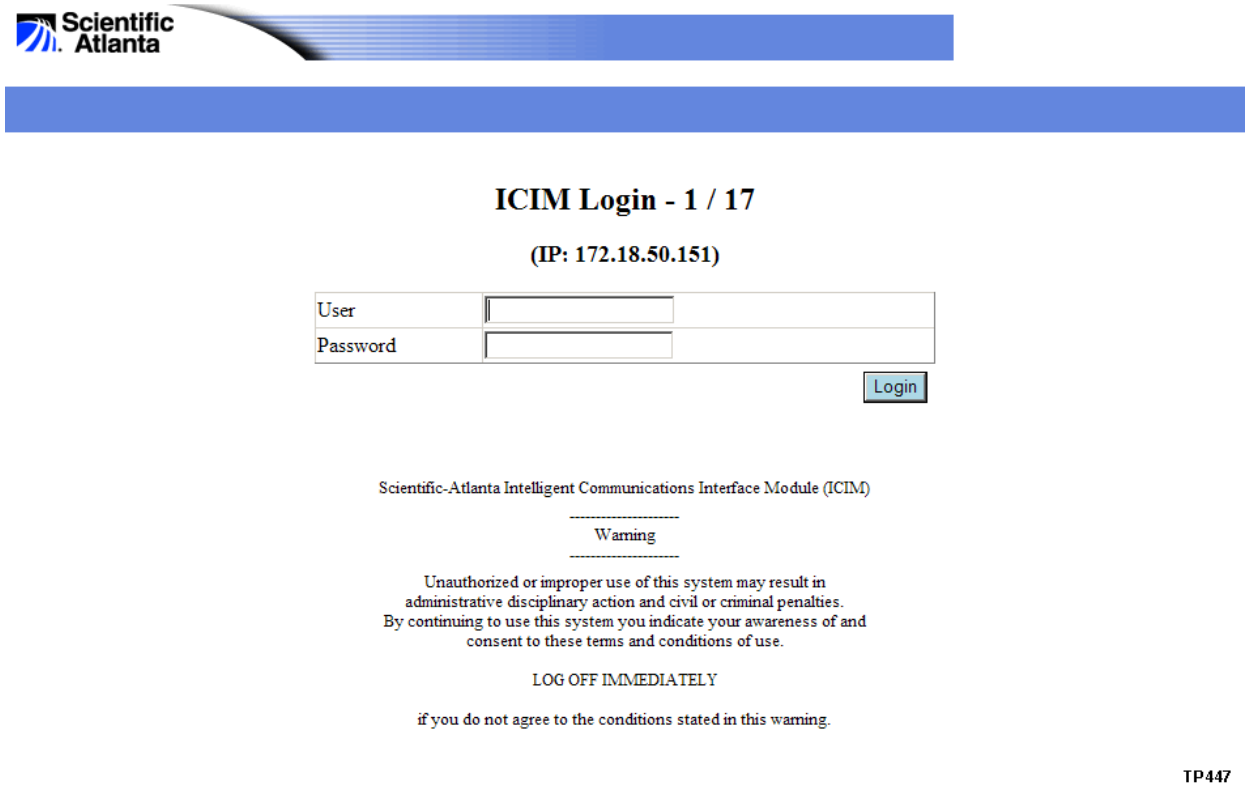
To Login

4. Press the **Enter** key or click the **Go** button. The ICIM Login page appears as shown below.


Scientific Atlanta
ICIM Login - 1 / 17
(IP: 172.18.50.151)
User
Password
Login
Scientific-Atlanta Intelligent Communications Interface Module (ICIM)
Warning
Unauthorized or improper use of this system may result in administrative disciplinary action and civil or criminal penalties. By continuing to use this system you indicate your awareness of and consent to these terms and conditions of use.
LOG OFF IMMEDIATELY
if you do not agree to the conditions stated in this warning.
TP447

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To Login

5. Type your **User** name and **Password** in the fields provided, and then click the **Login** button. The ICIM Welcome page appears as shown below.
6. Use one of the following navigation methods as appropriate:

- Click **Next** to go to the System View page. Or, wait 10 seconds to be taken to System View automatically.
- Use the menu at the left of the screen to go directly to System View or to choose another page of interest

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Using System View

- The System View page displays manufacturing information for the ICIM2 and selected modules. System View also allows you to view the current alarms for the ICIM2 and any application modules in the domain.

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Using System View

This table contains at least one, and possibly two, hyperlinks to other pages of the interface.

- Clicking the **details** link in the title takes you to the ICIM Details screen.
- Clicking the **Alarm Count** link when alarms are active takes you to the Current Alarms table.

These pages are described in later sections of this chapter

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To View Module Summary

- The Module Summary table at the bottom of the System View page lists the modules in the ICIM2 domain and identifies their chassis and slot locations, module types (if reported by the module) and devtypes, and the number of alarms currently active

Module Summary

Chassis/Slot	Module Name	Mod Type	Dev Type	Alarms	Details
1/0	XD-Chassis		5020	0	Details
1/1	HDTx	03dBm TS	1020	0	Details
1/2	HDTx	3dBm TXTS 1310 nm	1020	1	Details
1/3	HDTx	3dBm TXTS 1310 nm	1020	0	Details
1/4	HDTx	3dBm TXTS 1310 nm	1020	0	Details
1/5	HDTx		1032	0	Details
1/6	HDTx		1032	0	Details
1/7	HDTx		1032	0	Details
1/8	HDTx		1032	0	Details
1/9	HDTx		1032	1	Details
1/10	HDTx		1032	0	Details
1/11	HDTx		1032	0	Details
1/12	HDTx		1032	0	Details
1/13	HDTx		1032	0	Details
1/14	HDTx		1032	0	Details
1/15	HDTx		1032	0	Details
1/16	HDTx		1032	0	Details

TP451

Note: Clicking the **Details** link for a particular module displays the Module Details

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To View Current Alarms

- To view current alarms in the system, click the **Current Alarms** submenu item.

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To View Current Alarms

The Current Alarms page appears, displaying any active alarms in a table similar to the one shown below.

Current Alarms

Chas / Slot	Label	Time	Description
1/2	InRF	Tue, 04 Dec 2007 05:48:58 EST	Module=HDTx, Model=1020
1/9	InRF	Tue, 04 Dec 2007 05:49:07 EST	Module=HDTx, Model=1032

TP452

In this table:

- Chas/Slot is the number of the chassis and slot in which the module is located.
- Label is the name of the alarm.
- Time is the time at which the module went into alarm.
- Description is the module description

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To View Module Details

- When you click **Details** in the Module Summary table in System View, the Module Details screen for the corresponding module appears, as shown in the following example.

Module Details

Chassis/Slot	1/0
Module Name	XD-Chassis
Module Type	
Device Type	5020
Serial Number	^ABCDEFG
Time Of Service	38 hours
Downloadable	Yes
CLLI Code	N/A
CLEI Code	N/A
Self Test Message	Passed
Active Code Revision	1.01.05
Inactive Code Revision	1.01.04

Apply Cancel

TP456

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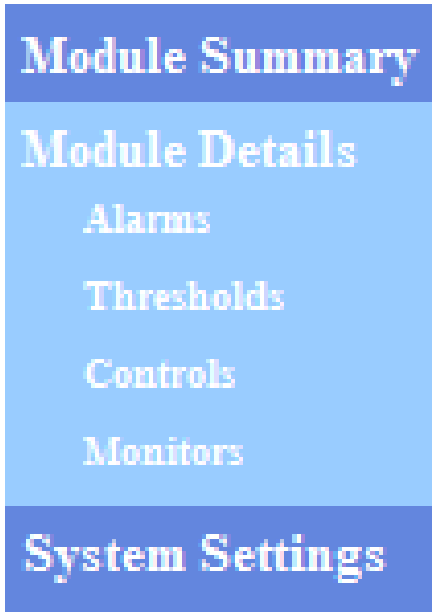
Module Details Submenu

- When the Module Details screen appears, a submenu lets you select Alarms, Thresholds, Controls, and Monitors for the module



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Thresholds

- To view the current threshold values for all alarms for the chosen module, click the **Thresholds** submenu option. The Module Alarm Thresholds table appears as shown below

Module Alarm Thresholds

XD-Chassis

(Chassis/Slot: 1/0)

Label	Type	Major Low	Minor Low	Value	Nominal	Minor High	Major High	Hysteresis	Range Low	Range High	
Fan1_Ok	6	N/A	N/A	0 (ok)	1	N/A	N/A	N/A	N/A	N/A	
Fan2_Ok	6	N/A	N/A	0 (ok)	1	N/A	N/A	N/A	N/A	N/A	
Fan3_Ok	6	N/A	N/A	0 (ok)	1	N/A	N/A	N/A	N/A	N/A	
ChasTemp	2	-40	-35	2 (ok)	25	60	65	1	-32768	32767	Apply
ConvAIn	5	N/A	N/A	0 (ok)	1	N/A	N/A	N/A	N/A	N/A	
ConvA+24	2	18	18.4	2 (ok)	24.7	25.9	26.1	0.1	-3276.8	3276.7	Apply
ConvA+5	2	3.6	3.7	2 (ok)	5.4	5.9	6.1	0.1	-3276.8	3276.7	Apply
ConvA-5	2	-5.6	-5.5	2 (ok)	-5.4	-4.6	-4.5	0.1	-3276.8	3276.7	Apply
ConvBIn	5	N/A	N/A	0 (ok)	1	N/A	N/A	N/A	N/A	N/A	
ConvB+24	2	18	18.4	2 (ok)	24.7	25.9	26.1	0.1	-3276.8	3276.7	Apply
ConvB+5	2	3.6	3.7	2 (ok)	5.4	5.9	6.1	0.1	-3276.8	3276.7	Apply
ConvB-5	2	-5.6	-5.5	2 (ok)	-5.4	-4.6	-4.5	0.1	-3276.8	3276.7	Apply

Cancel

TP458

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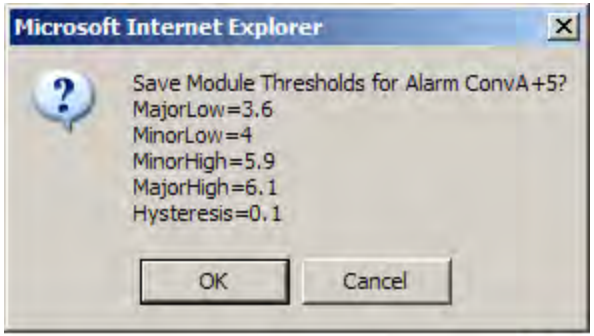
Thresholds

If any of the alarms have user-adjustable threshold values, these values are shown in ruled fields to indicate that they are editable.

- To change a threshold value, click inside the field, type the desired value, and then either click the **Apply** button to the right of the row containing the field. Or, you may press **Enter** to invoke the changes on that row immediately.
- To abort the change, click the **Cancel** button before clicking Apply. Clicking Cancel reloads the page, discarding any unapplied changes.
- After you click Apply, a popup window appears asking you to confirm the save operation



TP459

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Controls

- To review the control parameters for the chosen module, click the **Controls** submenu option. The Module Controls table appears as shown below

Module Controls

XD-Chassis

(Chassis/Slot: 1/0)

Label	Value	Units / Choices	Low	High	Step	
AlmMuteA	0	(0) Off, (1) On	0	1	1	Apply
AlmMuteB	0	(0) Off, (1) On	0	1	1	Apply

Cancel

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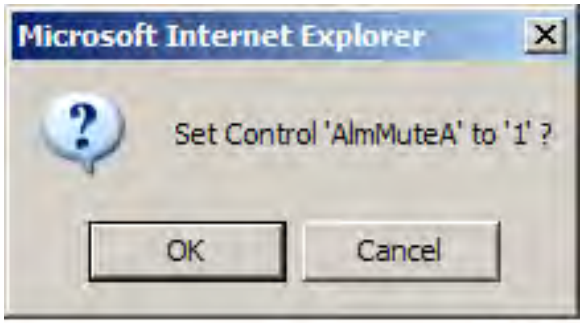
Controls

- To change a control value, click inside the field, type the desired value, and then either click the **Apply** button to the right of the row containing the field. Or, you may press **Enter** to invoke the changes on that row immediately.
- To abort the change, click the **Cancel** button before clicking Apply. Clicking Cancel reloads the page, discarding any unapplied changes
- After you click Apply, a popup window appears asking you to confirm the save operation:



TP461

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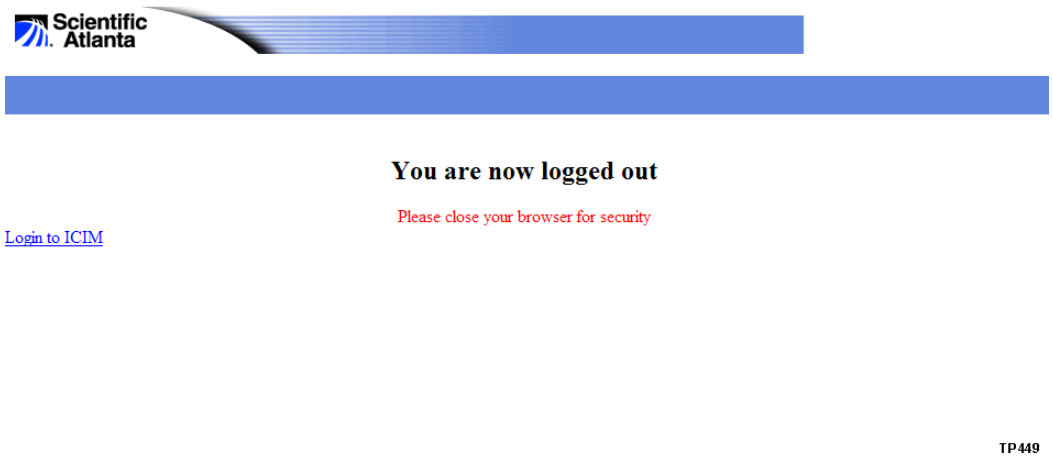
To Log Out

Complete the following steps to log out of the Web Interface.

1. Click **Logout** in the main menu. The Web Interface Logout page appears as shown below



2. Close your browser window as a security precaution

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1550 Broadcast EMT

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BC TX EMT Description

- The Prisma II 1550 nm Externally Modulated Transmitters (EMTs) are plug-in modules for the Prisma II platform. Microprocessor control allows ease of installation and flexibility of application.
- The transmitter design includes an array of capabilities, such as low RF input level, and elective Automatic Gain Control (AGC)

Options

✓Multiple ITU and Non ITU wavelength options (recommend using ITU)

✓Long Reach EMT, PII-15TXL ITU40 #737283 CIFA 28312, ITU18 #737287 CIFA 64028

✓Extended Reach EMT, PII-15TXX ITU40 #737279 NO CIFA, ITU18 #737280 NO CIFA

Features

✓10dBm output

✓Front panel green light emitting diode (LED) to indicate operating status

✓Front panel red LED to indicate alarm status

✓-20 dB test point relative to input

Product Application

✓Transporting broadcast analog and QAMs HE to Hub or Node

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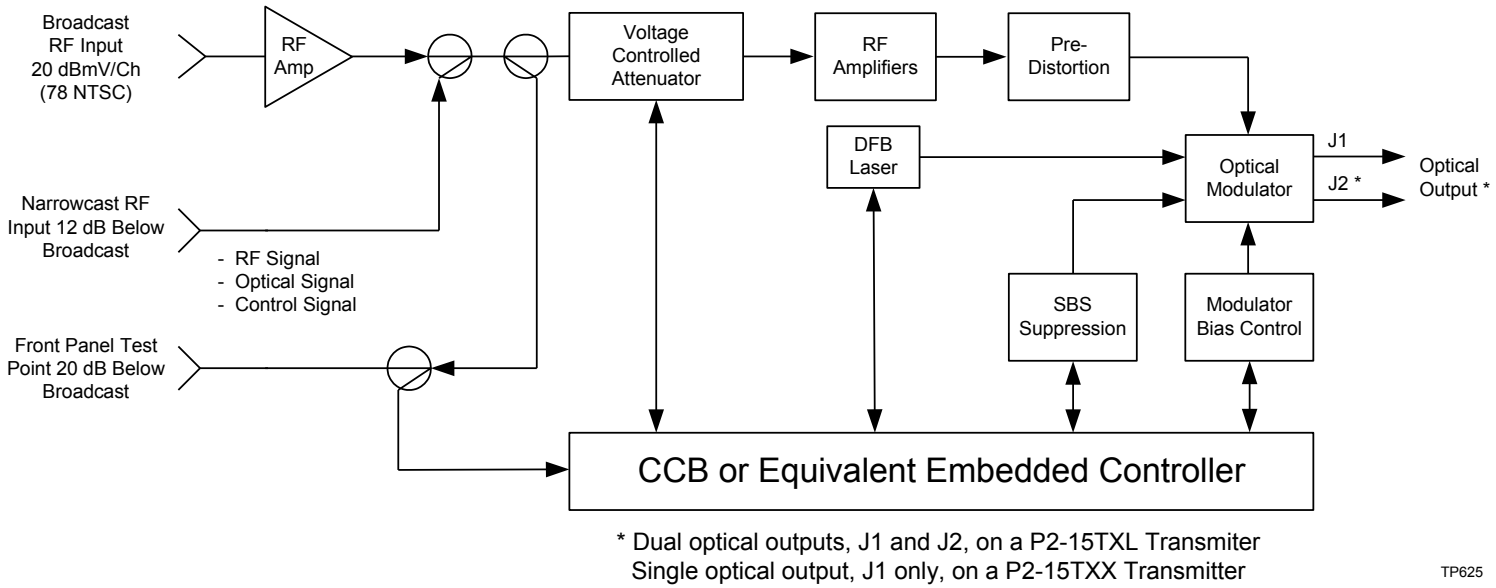
1550 EMT Operations

- The Prisma II 1550 nm Transmitters receive an RF signal through a connector on the rear of the module. The RF input signal is then amplified and converted to an optical signal.



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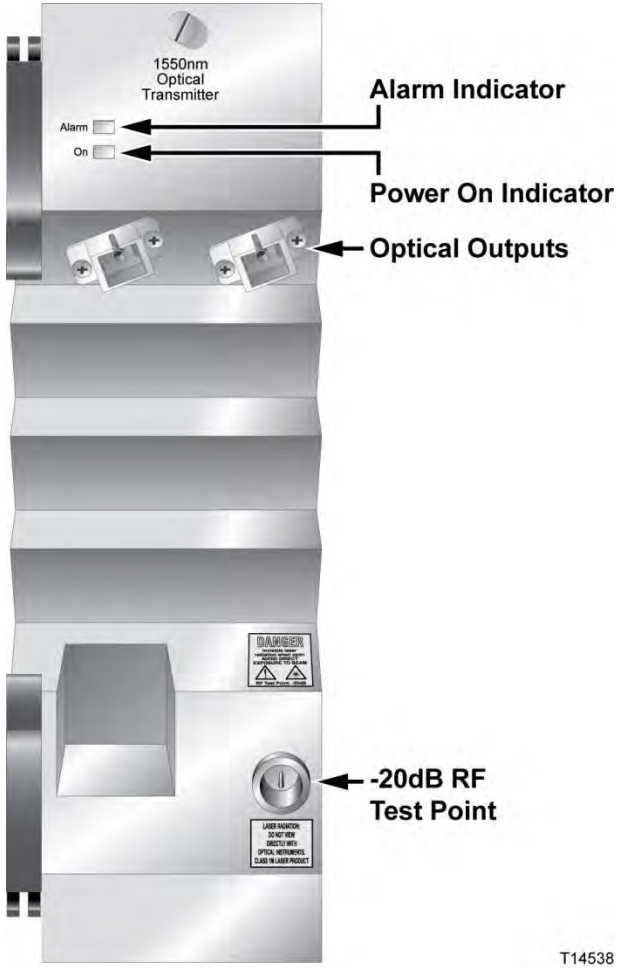
Front Panel

Feature	Description
Alarm indicator	Illuminates or blinks when an alarm condition occurs.
Power On indicator	Illuminates when power is supplied to the module.
Optical output	Connects the output signal to the optical cable.
-20 dB test point	Provides a -20 dB sample of the RF input signal.

NOTE: The PII-15TXL is a two-port device, while PII-15TXX is a one-port device. Secondary output (J2) may have some performance degradation as compared with primary output. Use primary (J1) for main path secondary for backup



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Configuration Methods and Summary

Methods

- Command line interface (CLI)
- ICIM Web Interface
- Simple Network Management Protocol (SNMP)
- Local Craft Interface (LCI)
- ICIM keypad (PII chassis only)

Configuration Summary

Using any of the above methods, you can configure the following parameters.

- Enable Laser
- Laser Mode
- AGC
- RF Drive Level to the Laser
- Optical Modulation Index (OMI) Level
- Master/Slave Mode
- RFLasSet
- Length (km)
- LowRF Alarm Inhibit

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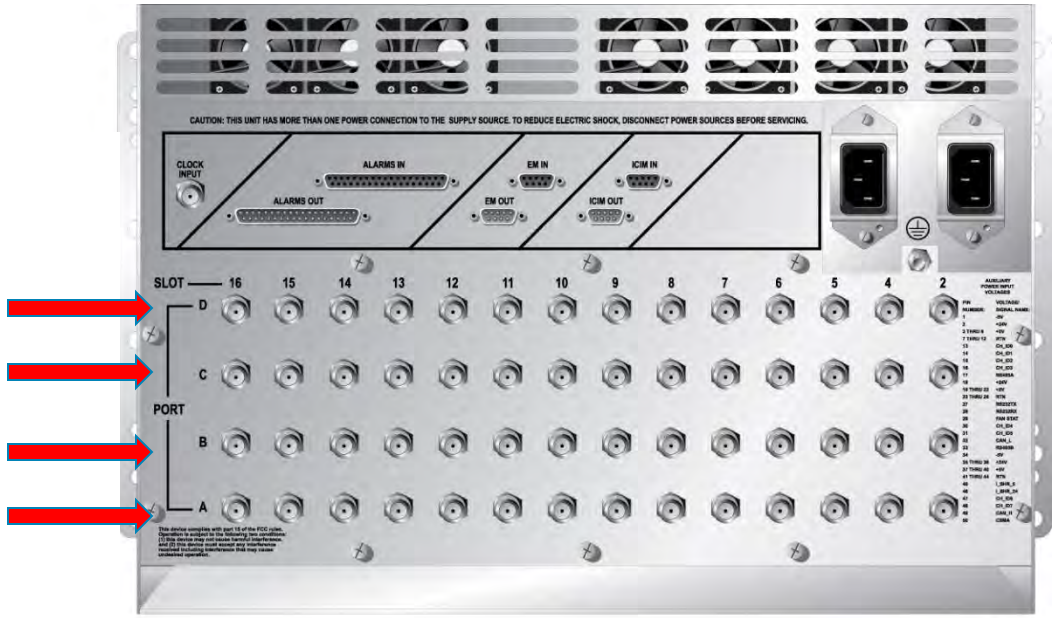
Connecting RF Cables

- The chassis back panel has four RF connectors, A, B, C & D for each application module slot. Each of RF connectors is numbered to show its corresponding slot number.

"D" Not used with EMT
"C" Not used with EMT
"B" NC Input
"A" BC Input



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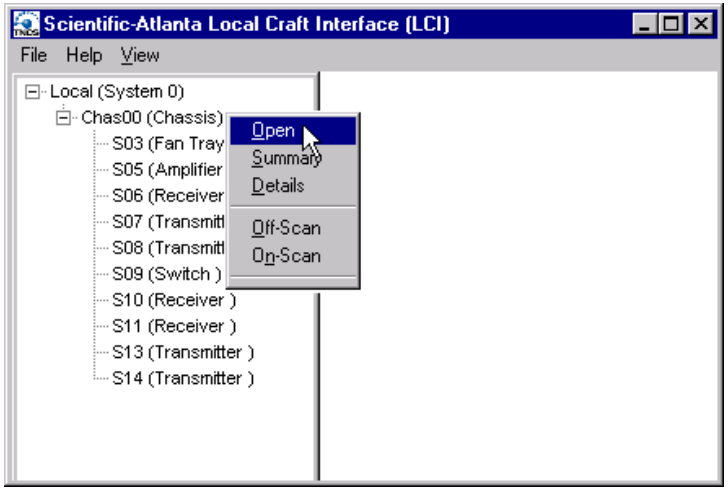
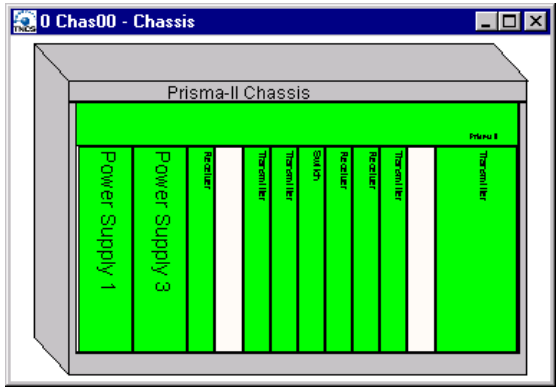
Operation Using LCI

1. Right-click the chassis, and then click **Open**.



Result: A graphic representation of the chassis appears



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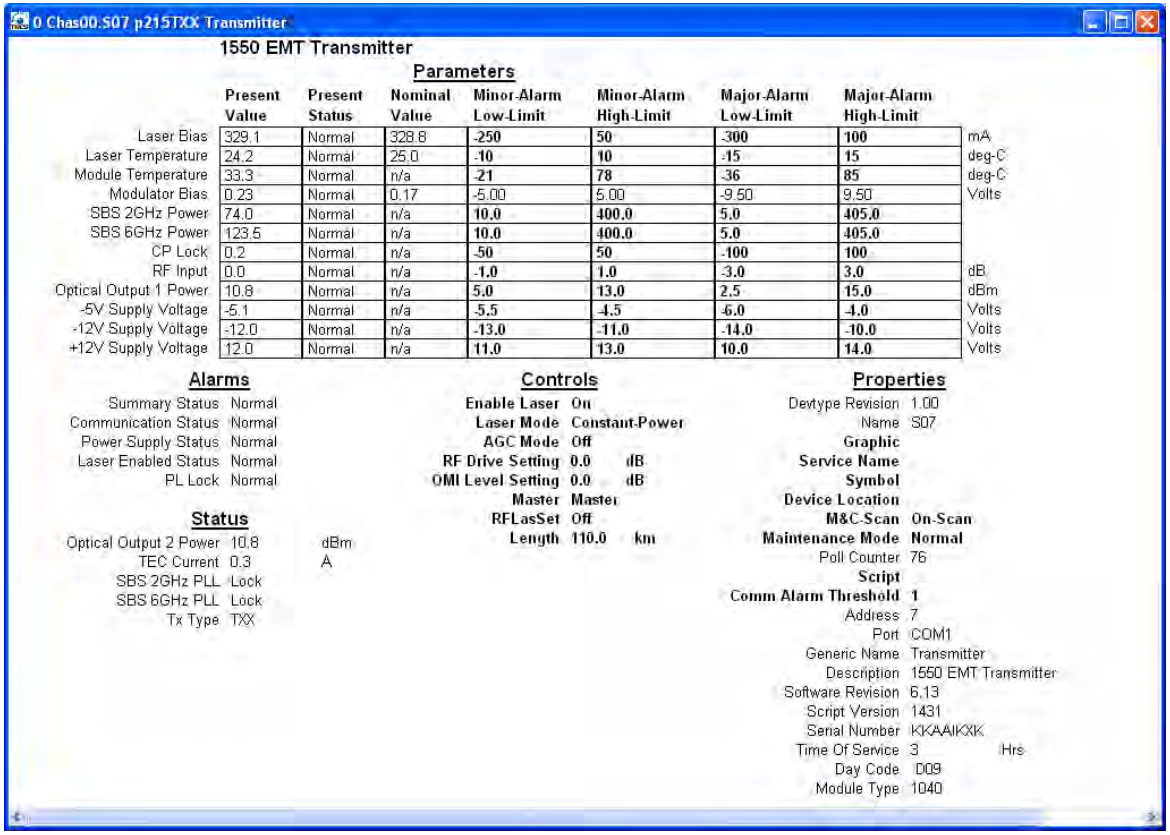
Operation Using LCI

2. Double-click the module whose information you want to view or configure.

- **Result:** The Module Details window appears


0 Chas00:S07 p215TXX Transmitter
1550 EMT Transmitter
Parameters
Present Value | Present Status | Nominal Value | Minor-Alarm Low-Limit | Minor-Alarm High-Limit | Major-Alarm Low-Limit | Major-Alarm High-Limit
Laser Bias 329.1 Normal 328.8 -250 50 -300 100 mA
Laser Temperature 24.2 Normal 25.0 -10 10 -15 15 deg-C
Module Temperature 33.3 Normal n/a -21 78 -36 85 deg-C
Modulator Bias 0.23 Normal 0.17 -5.00 5.00 -9.50 9.50 Volts
SBS 2GHz Power 74.0 Normal n/a 10.0 400.0 5.0 405.0
SBS 6GHz Power 123.5 Normal n/a 10.0 400.0 5.0 405.0
CP Lock 0.2 Normal n/a -50 50 -100 100
RF Input 0.0 Normal n/a -1.0 1.0 -3.0 3.0 dB
Optical Output 1 Power 10.8 Normal n/a 5.0 13.0 2.5 15.0 dBm
-5V Supply Voltage -5.1 Normal n/a -5.5 -4.5 -6.0 -4.0 Volts
-12V Supply Voltage -12.0 Normal n/a -13.0 -11.0 -14.0 -10.0 Volts
+12V Supply Voltage 12.0 Normal n/a 11.0 13.0 10.0 14.0 Volts
Alarms
Summary Status Normal
Communication Status Normal
Power Supply Status Normal
Laser Enabled Status Normal
PL Lock Normal
Status
Optical Output 2 Power 10.8 dBm
TEC Current 0.3 A
SBS 2GHz PLL Lock
SBS 6GHz PLL Lock
Tx Type TXX
Controls
Enable Laser On
Laser Mode Constant-Power
AGC Mode Off
RF Drive Setting 0.0 dB
OMI Level Setting 0.0 dB
Master Master
RFLasSet Off
Length 110.0 km
Properties
Devtype Revision 1.00
Name S07
Graphic
Service Name
Symbol
Device Location
M&C-Scan On-Scan
Maintenance Mode Normal
Poll Counter 76
Script
Comm Alarm Threshold 1
Address 7
Port COM1
Generic Name Transmitter
Description 1550 EMT Transmitter
Software Revision 6.13
Script Version 1431
Serial Number KKAAIKXK
Time Of Service 3 Hrs
Day Code D09
Module Type 1040

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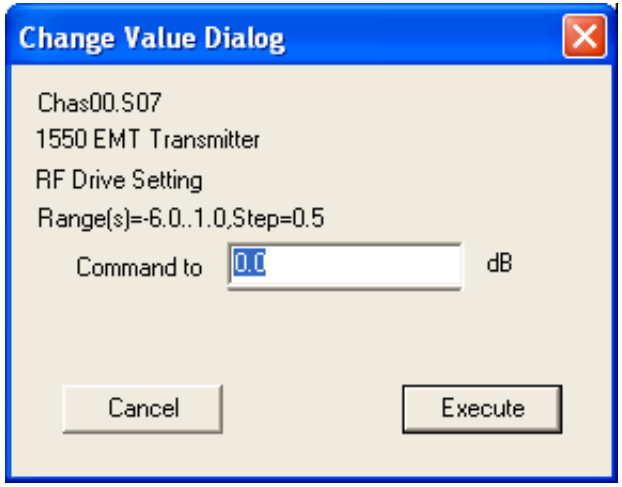
Operation Using LCI

3. Under **Controls,** double-click the parameter you want to configure.

- **Result:** The Change Value Dialog box appears. This example shows the dialog box for the RF Drive Setting parameter.



4. Depending on the parameter you chose, select or type a new value.
5. Click **Execute**.

- **Result:** The new value appears next to the parameter.

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EMT Operating Status Parameters

Parameter Name (LCI)	ICIM Abbreviation	Function	Typical Value
Optical Output 1 Power	OutPwr1	Displays optical output power at port 1.	+10.0 dBm
Optical Output 2 Power (TXL)	OutPwr2 (TXL)	Displays optical output power at port 2.	+10.0 dBm
Laser Bias	LasBias	Displays measured laser bias current.	270 mA
RF Input	InRF	Displays RF input level.	0 dB
Module Temperature	ModTemp	Displays module temperature.	Ambient °C + 30°C
CP Lock	CPLock	Indicates constant power loop lock.	0.4
TEC Current	TecCur	Indicates laser thermoelectric cooler current.	0.2 A
Laser Temperature	LasTemp	Displays laser temperature.	30°C
Tx Type	TxType	Indicates Transmitter Extended Reach (TXX) or Long Reach (TXL).	TXX or TXL
Modulator Bias	ModBias	Indicates modulator bias voltage level.	0.128 VDC
SBS 2 GHz PLL	Sbs1Stat	SBS phase lock loop 1 lock status.	LOCK
SBS 6 GHz PLL	Sbs2Stat	SBS phase lock loop 2 lock status.	LOCK
SBS 2 GHz Power	Psbs2G	Indicates 2 GHz SBS power level.	90.5
SBS 6 GHz Power	Psbs6G	Indicates 6 GHz SBS power level.	120.0
-5V Supply Voltage	-5VInt	Displays internal -5 VDC supply voltage.	-5 VDC
-12V Supply Voltage	-12VInt	Displays internal -12 VDC supply voltage.	-12 VDC
+12V Supply Voltage	+12VInt	Displays internal +12 VDC supply voltage.	+12 VDC

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EMT Configurable Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
Enable Laser	Enable	Enables or disables amplifier operation, i.e., turns the laser on or off.	ON (1) = Enabled OFF (0) = Disabled	ON (1)
Laser Mode	LasMode	Selects one of two laser operating modes: constant current (i.e., constant wavelength) or constant power.	Constant Current (ConstCur) Constant Power (ConstPwr)	ConstPwr
AGC Mode	AGC	Turns automatic gain control on or off.	ON (1) Off (0)	OFF (0)
RF Drive Setting	RFDrive	Sets the relative RF drive level into the transmitter. Only effective when AGC is off (manual gain control).	-6.0 dB to +1.0 dB in 0.5 dB steps (Negative decreases drive, positive increases drive)	0.0 dB
OMI Level Setting	OMISet	Sets the optical modulation index level. Only effective when AGC is on. **Note:** When AGC is active, it maintains a constant OMI for input powers between -3 dB and +1 dB from nominal when OMI level is set to 0 dB. In general, guaranteed AGC range is (-3 + OMI Level) dB to +1 dB. For example, for an OMI level setting of +1 dB, the guaranteed AGC range is 2 dB to +1 dB. Actual AGC range is typically larger.	-6.0 dB to +1.0 dB in 0.5 dB steps (Negative decreases drive, positive increases drive)	0.0 dB

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EMT Configurable Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
Master	Master	Configures the module as master or slave: If set to Master, the transmitter is controlled only by the Enable control above. If set to Slave, the transmitter is controlled by a combination of Enable and the external input CNT_IN_1.	ON (1) = Master OFF (0) = Slave	ON (1) = Master
RFLasSet	RFLasSet	Configures the transmitter to shut down the laser when an alarm threshold is met.	ON (1) OFF (0)	OFF (0)
Length	Length	Optimizes transmitter performance based on the distance or span of the link.	65 km to 105 km in 1 km steps (TXL) 100 km to 140 km in 1 km steps (TXX)	65 km (TXL) 100 km (TXX)

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Prisma 1550 High Density S-QAM Full Spectrum Transmitter

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Prisma S-QAM Full Spectrum Tx

Overview

- The SQAM-FS is a series of full spectrum (low analog high QAM) transmitters designed for medium reach (40km) DWDM point to multipoint applications feeding multiple nodes with a single fiber

Features

- The new SQ-FS TX is a low chirp laser built and tuned for 30 analog + QAMs. **CMAP COMPLIANT!**
- Optical Output Power: 10 dBm
- Wavelength mapped to minimize noise penalty from optical beating (four wave mixing)
- Standard based ITU channel's, ITU 20,21,23,27,28,30,34,35 (Note: wavelength plan extended to 16 lasers)

  Uses LGX-DWDM-MXDX #4040589 and CASSETTE #4040816

- Small $C0_2$ footprint: Low power consumption, 7.5 watts per Tx

Product Application

- ✓ In broadcast networks transporting analog and QAM to node
- ✓ 1310 replacement for fiber starved areas – 1 fiber per 8 nodes
- ✓ For HE to HUB O/E transport of QAM channels

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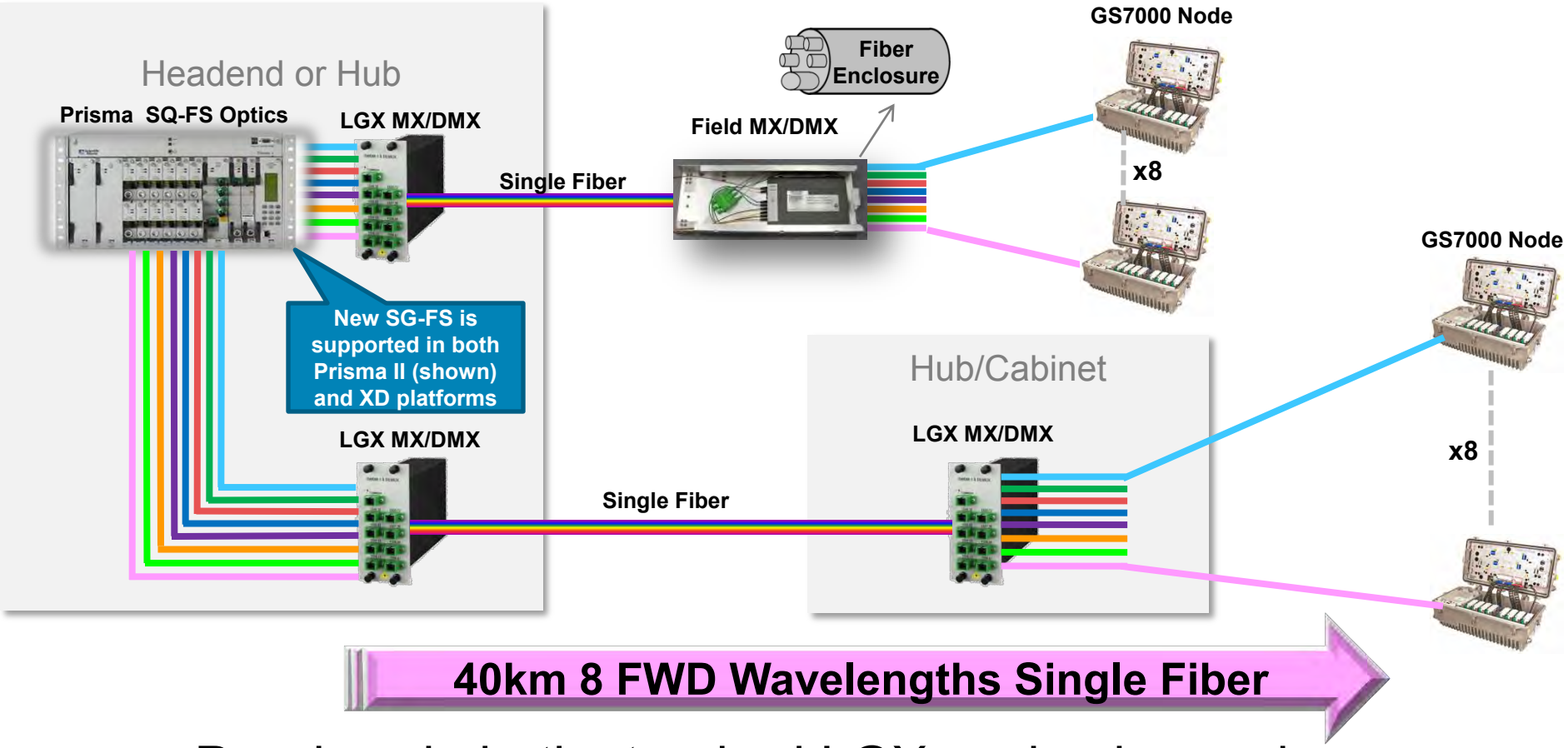
SQAM-FS Example Architecture



- Passives in both standard LGX packaging and cassette style for field deployment

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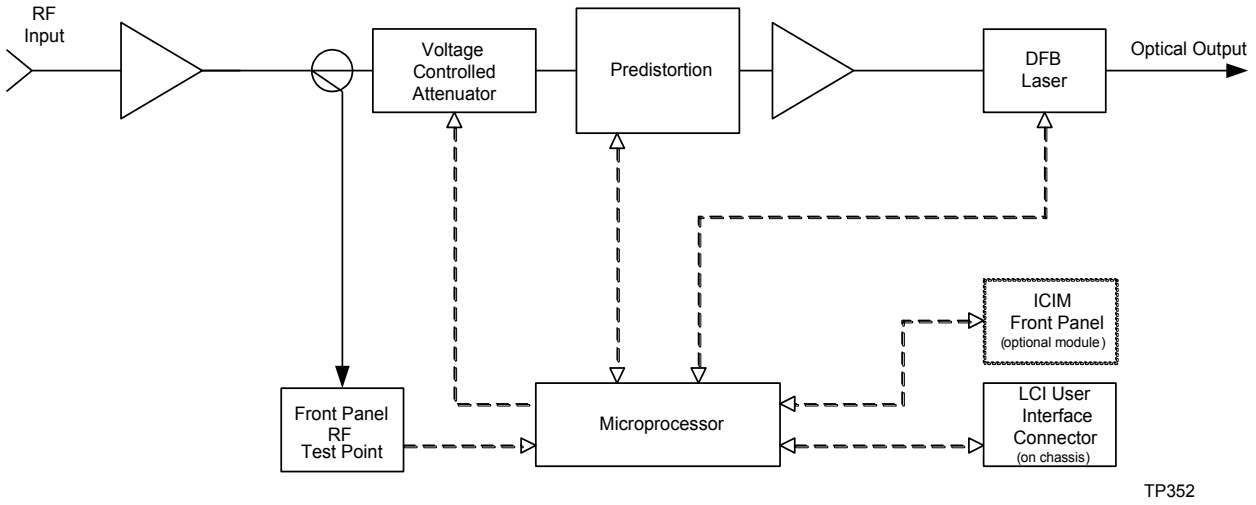
S-QAM FS TX Operation

- The RF input signal is amplified before being converted to an optical signal using a high-performance, isolated distributed feedback (DFB) laser.
- The incoming RF signal is also routed through a coupler to an RF detector circuit. The RF detector produces a DC voltage proportional to incident RF power that is used to monitor the input power level.



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S-QAM FS TX Operation

- Transmitter gain is controlled through the selection of Manual or Automatic Gain Control (AGC) mode operation.
- In Manual mode, an attenuator can be used to reduce RF power. It may be desirable to make such adjustments to compensate for power differences if the channel load differs from the specified value.
- In AGC mode, the microprocessor monitors the actual input composite power and adjusts the attenuator to maintain constant RF drive level into the laser diode.

Note: If Analog or QAM loading is to remain constant – not expanding using AGC is OK however IF channel load differs the AGC will self adjust accordingly resulting in RF level change at Node RX.

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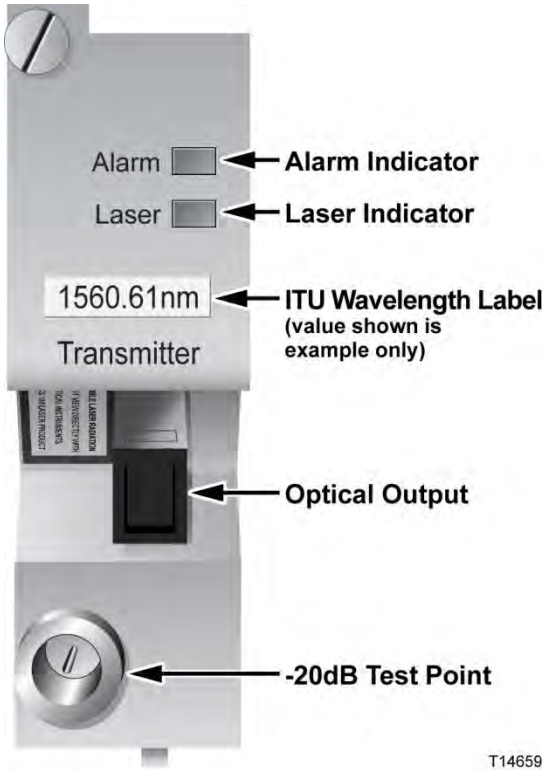
SQAM-FS TX Front Panel

Part	Function
Alarm Indicator	Illuminates or blinks when an alarm condition occurs.
Laser Indicator	Illuminates when laser is active.
Optical Output	Connects the output signal to the optical cable.
-20 dB Test Point	Provides a -20 dB sample of the RF input signal.



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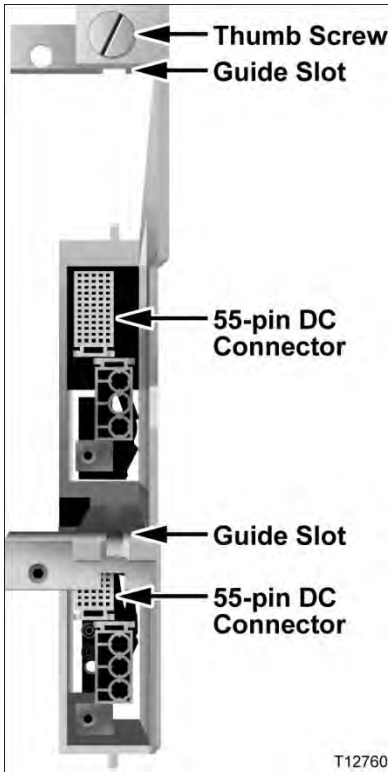
Host Module

- A host module is required to mount the application module in a standard Prisma II Chassis. The host module doubles the density of the Prisma II Chassis by providing two high density module slots for each current Prisma II slot.

Host Module Empty



Host Module Populated

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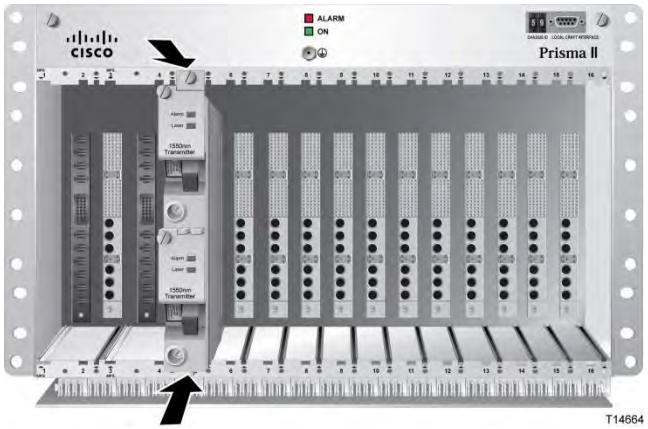
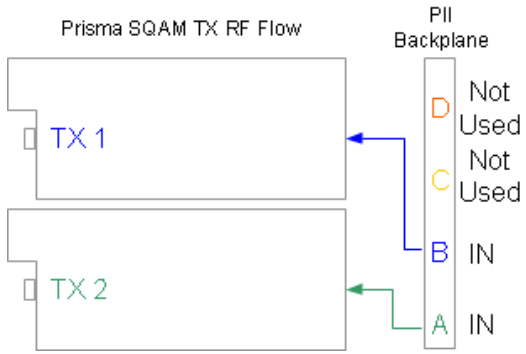
Prisma II Chassis Installation

- When installed in a Prisma II standard chassis, the module is placed in a host module and then inserted into the chassis in slots 5 through 16.
- If the module occupies the upper host module position, its slot number is the same (5 through 16) as that of the host module.





- If the module occupies the lower host module position, its slot number is 16 plus the host module slot number, or 21 through 32.
- Slots 1 through 4 are usually reserved for the power supplies. If an ICIM is installed, it occupies slots 15 and 16. If an ICIM is not installed, any other module (or host module) can occupy these slots.

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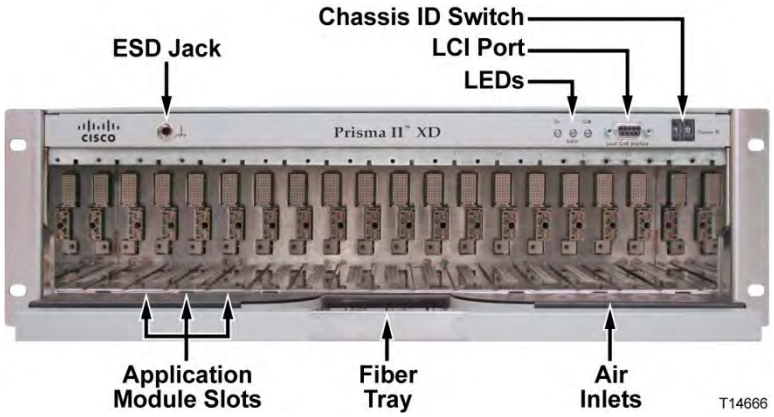
Install the Module in a XD Chassis

1. Locate the fiber tray at the bottom of the chassis and the application module slots inside the chassis as shown in the following illustration



2. Align the ridges on the top and bottom of the module with the module guide slots located on the chassis.
3. Gently slide the module into the chassis until its power and communications connections join connectors on the midplane bus. *Do not force the module into the chassis*. If properly aligned, it should slide in with minimal force.

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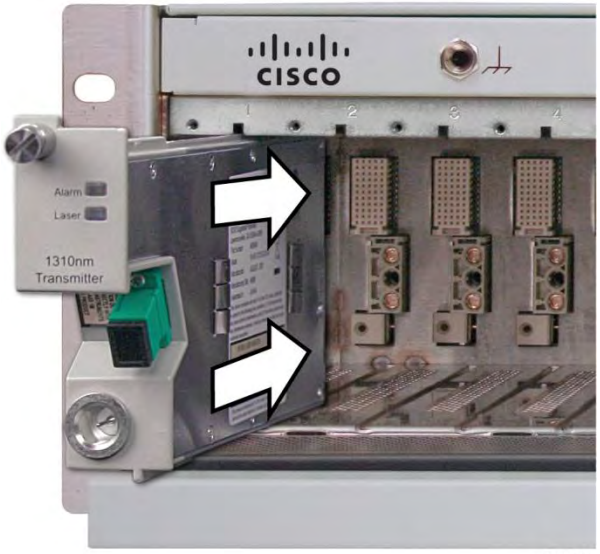
Install the Module in a XD Chassis



4. Tighten the screw at the top of the module to secure it in the chassis. Use a 3/8-in. flat-blade screwdriver to secure. *Do not over-tighten*.
5. Fill any unused chassis slots with module blanks to help ensure proper cooling air flow.

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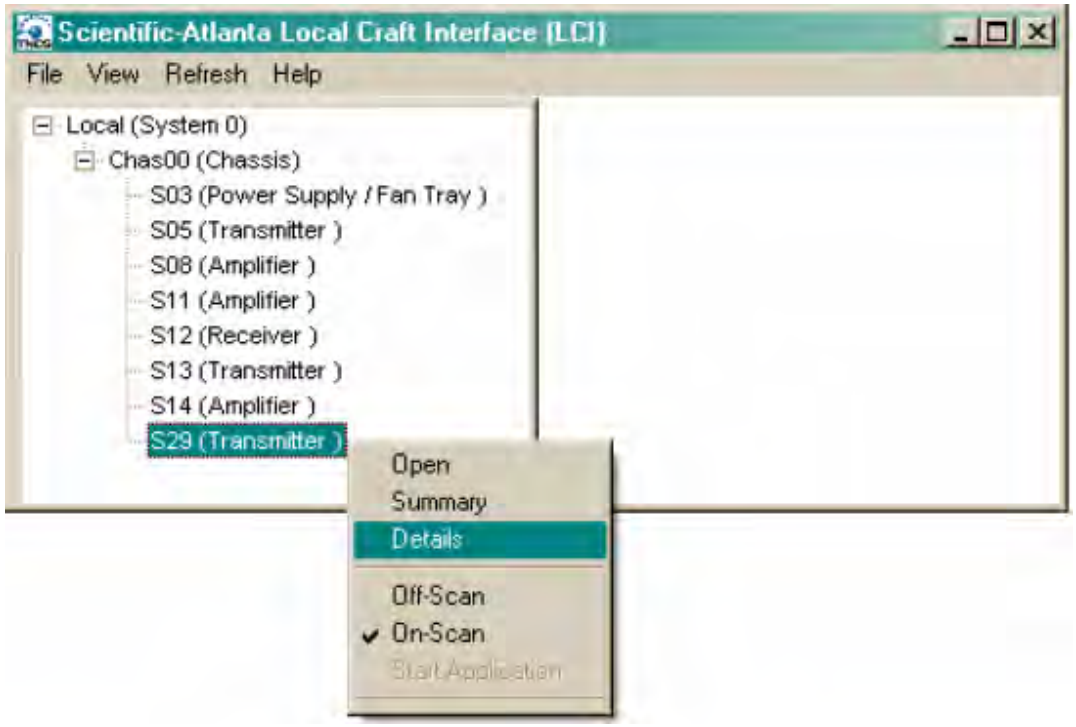
Configuring the Module using LCI

1. In the module tree, right-click the module, and then click **Details**



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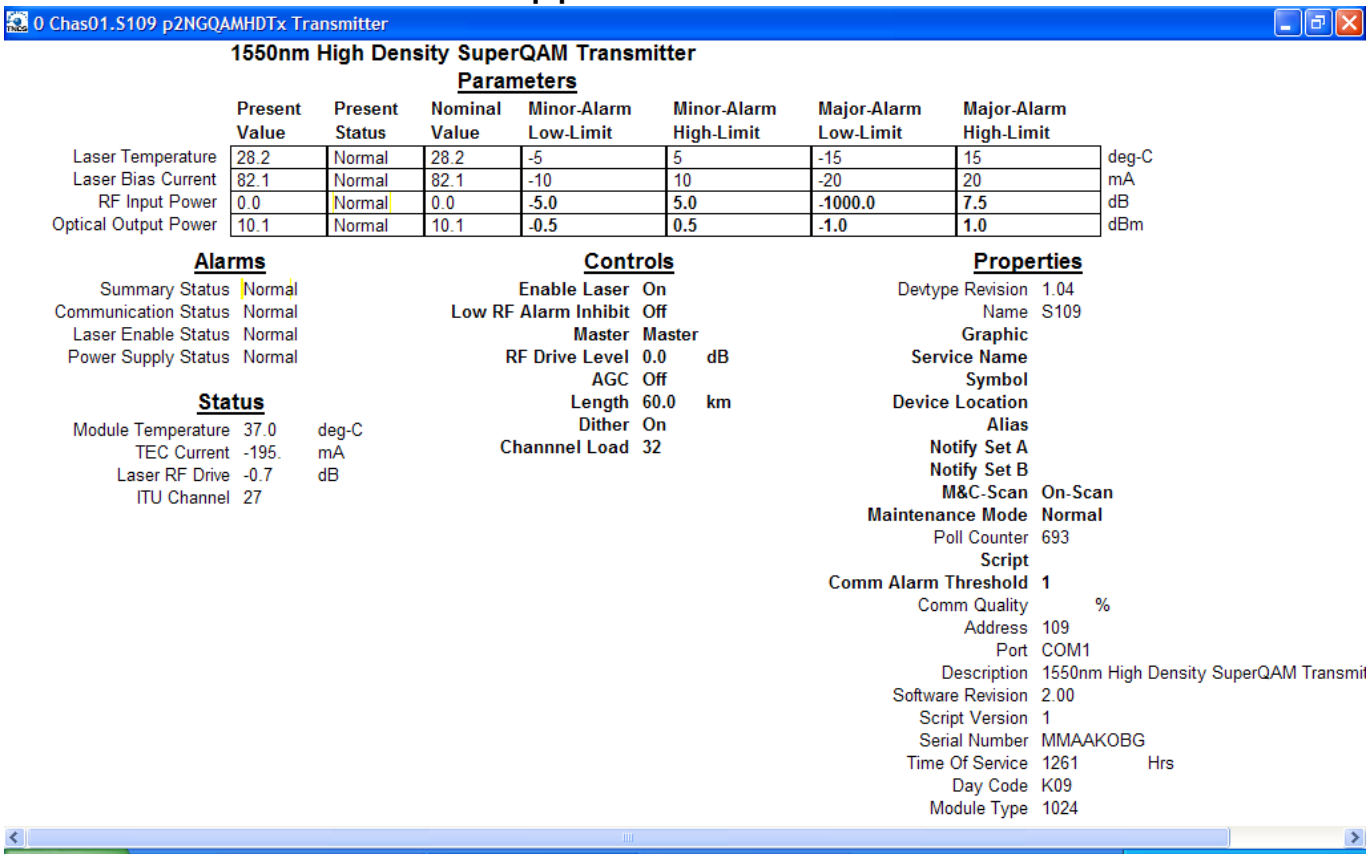
Configuring the Module using LCI

- The Module Details window appears as shown below



2. Under **Controls,** double-click the parameter you want to configure to display its Change Value dialog box. For example

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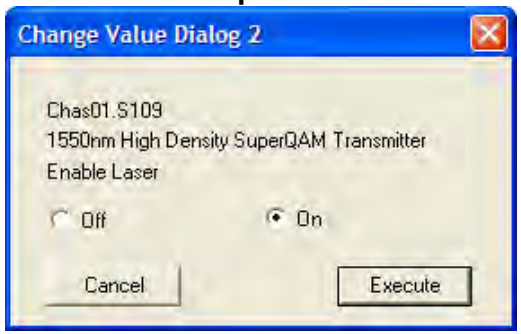
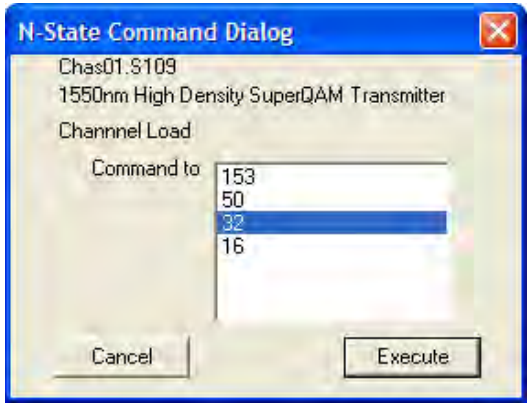
Configuring the Module using LCI

- Double-clicking the Enable Laser parameter displays the Enable Laser dialog box.



- Double-clicking the Channel Load parameter displays the Channel Load dialog box.



3. Depending on the parameter you chose, select or type a new value.
4. Click **Execute**. The new value appears next to the parameter

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S-QAM FS Operating Status Parameters

Parameter Name (LCI)	ICIM Abbreviation	Function	Typical Value
Optical Output Power	OutPwr	Displays optical output power.	10.1 dBm
Laser Bias Current	LasBias	Displays laser bias current.	88 mA
RF Input Power	InRF	Displays RF input level.	0.0 dB
Module Temperature	ModTemp	Displays module temperature.	28.5 °C
TEC Current	TecCur	Displays laser thermoelectric cooler current.	112.9 mA
Laser Temperature	LasTemp	Displays laser temperature.	19.0 °C
Laser RF Drive	LasRF	RF drive level at laser input reference to nominal setup.	-1.5 dB
Laser Enable	Enable	Laser on/off.	-
Low RF Alarm Inhibit	LoRFInh	Low RF alarm enabled/disabled.	-
Master	Master	Master or Slave operation.	-
RF Drive Level	RFDrive	RF drive level reference to nominal setup.	0.0
AGC	AGC	Automatic Gain Control.	-
Length	FibLinDi	Displays distance setting in kilometers.	40 km
Dither	Dither	Displays dither On/Off (usually Off).	-

Note: Monitored values may vary from module to module. The values shown above are examples only

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S-QAM FS Configurable Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
Laser Enable	Enable	Enables or disables amplifier operation; turns the laser on or off.	ON (1) = Enabled OFF (0) = Disabled	ON (1)
Low RF Alarm Inhibit	LoRFInh	Enables or disables the "RF input low" alarm.	ON (1) = Alarm Enabled OFF (0) = Alarm Disabled	OFF (0)
Master	Master	Configures the module as master or slave: If set to Master, the transmitter is controlled only by the Enable control above. If set to Slave, the transmitter is controlled by a combination of Enable and the external input CNT_IN_1.	ON (1) = Master OFF (0) = Slave	ON (1)

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S-QAM Configurable Parameters

Parameter Name (LCI)	ICIM Abbreviation	Description	Values	Default
RF Drive Level	RFDrive	Sets the relative RF drive level into the transmitter. Only effective when AGC is off (manual gain control).	-5.0 dB to +3.0 dB in 0.5 dB steps (Negative decreases drive, positive increases drive)	0.0 dB
Automatic Gain Control	AGC	Turns automatic gain control on or off.	ON (1) OFF (0)	OFF (0)
Length	FibLinDi	Sets the nominal link distance for optimum performance.	0 to 60 km in 0.5 km steps	40 km
Dither	Dither	Turns Dither on or off. Dither may need to be turned off for high drive levels or low channel loads in order to improve performance.	ON (1) OFF (0)	OFF (0)
Channel Preset		Preset channel settings and tuning for four contiguous channel loads	16, 32, 50 and 153 chnl settings	153

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S-QAM FS Input Specifications

Number of Channels in a Load	Input Power per Channel (dBmV)
79QAM	15.5
115QAM	14
133QAM	13.5
153QAM	13
30Analog + 104QAM	18/12

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Prisma 1310 High Density Transmitter

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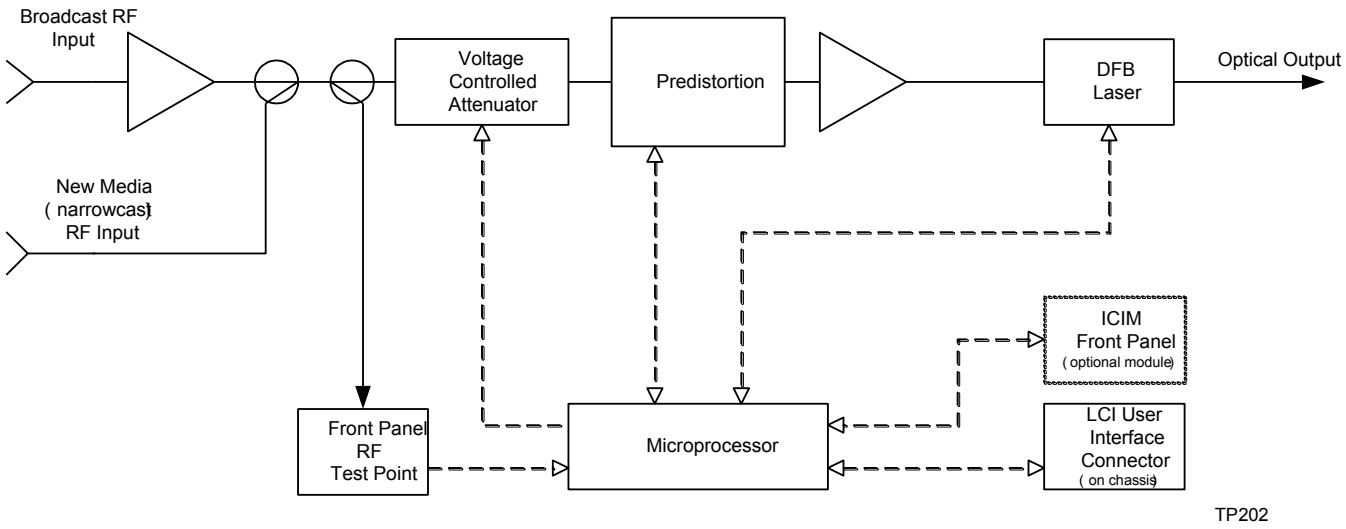
1310 TX Operation

- The RF input signal is amplified before being converted to an optical signal using a high-performance, isolated distributed feedback (DFB) laser.
- The incoming RF signal is also routed through a coupler to an RF detector circuit. The RF detector produces a DC voltage proportional to incident RF power that is used to monitor the input power level.



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1310 TX Operation

- Transmitter gain is controlled through the selection of Manual or Automatic Gain Control (AGC) mode operation.
- In Manual mode, an attenuator can be used to reduce RF power in an overdrive condition or to compensate for variations in transmitter gain. Any manual attenuator adjustments are reflected in the indicated RF drive level. It may be desirable to make such adjustments to compensate for power differences if the channel load differs from the specified value.
- In AGC mode, the microprocessor monitors the actual input composite power and adjusts the attenuator to maintain constant RF drive level into the laser diode.

Note: If Analog or QAM loading is to remain constant – not expanding using AGC is OK however IF channel load differs the AGC will self adjust accordingly resulting in RF level change at Node RX.

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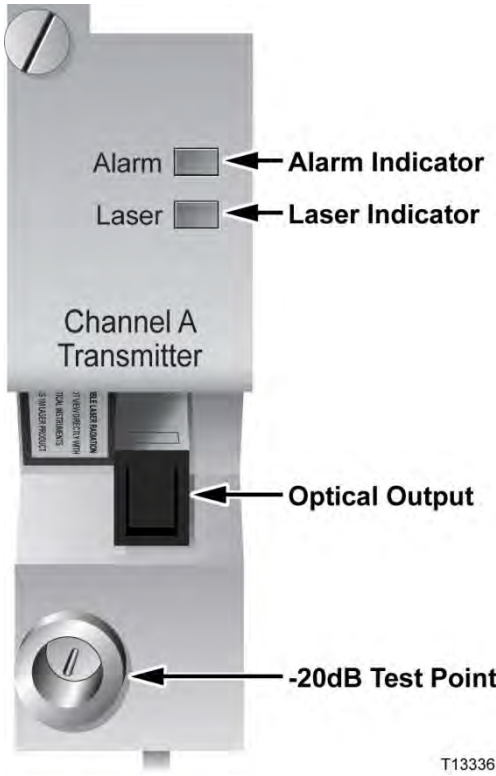
1310 TX Front Panel

Part	Function
Alarm Indicator	Illuminates or blinks when an alarm condition occurs.
Laser Indicator	Illuminates when laser is active.
Optical Output	Connects the output signal to the optical cable.
-20 dB Test Point	Provides a -20 dB sample of the RF input signal.



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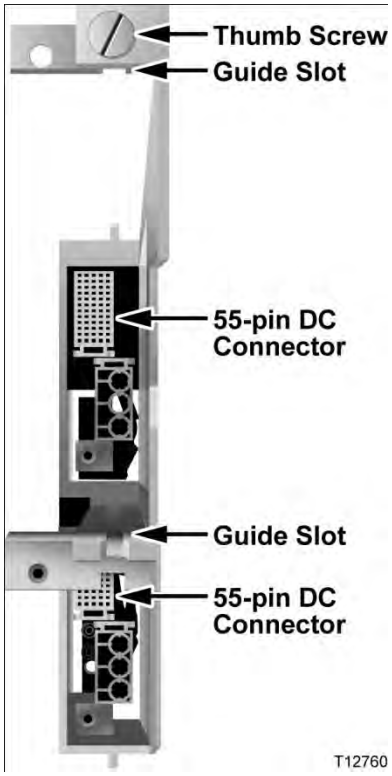
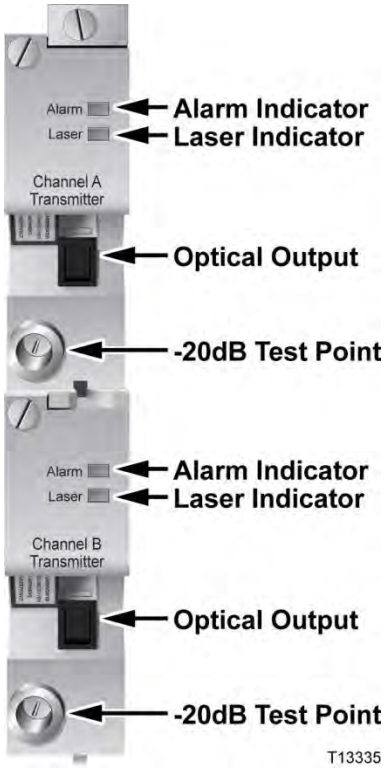
Host Module

- A host module is required to mount the application module in a standard Prisma II Chassis. The host module doubles the density of the Prisma II Chassis by providing two high density module slots for each current Prisma II slot.

Host Module Empty



Host Module Populated



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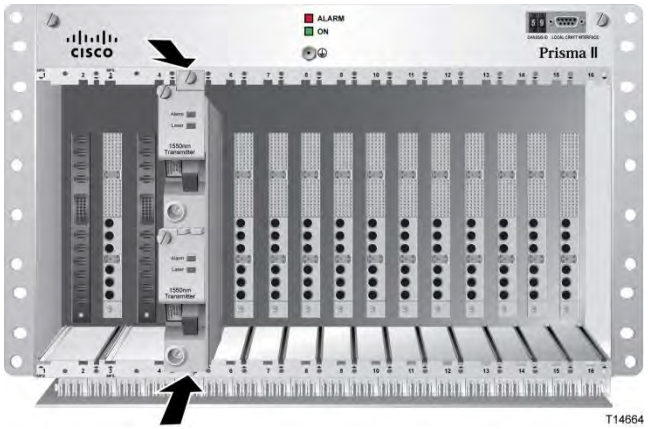
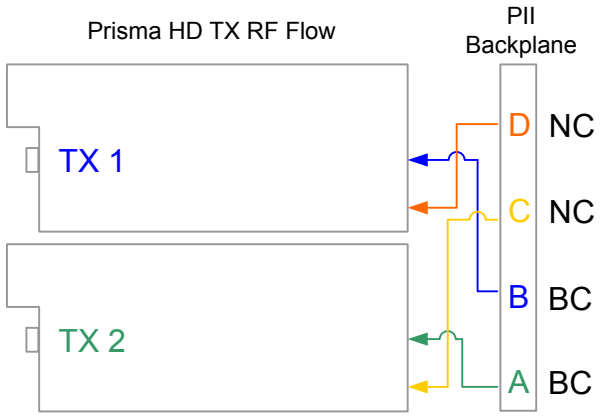
Prisma II Chassis Installation

- When installed in a Prisma II standard chassis, the module is placed in a host module and then inserted into the chassis in slots 5 through 16.
- If the module occupies the upper host module position, its slot number is the same (5 through 16) as that of the host module.





- If the module occupies the lower host module position, its slot number is 16 plus the host module slot number, or 21 through 32.
- Slots 1 through 4 are usually reserved for the power supplies. If an ICIM is installed, it occupies slots 15 and 16. If an ICIM is not installed, any other module (or host module) can occupy these slots.

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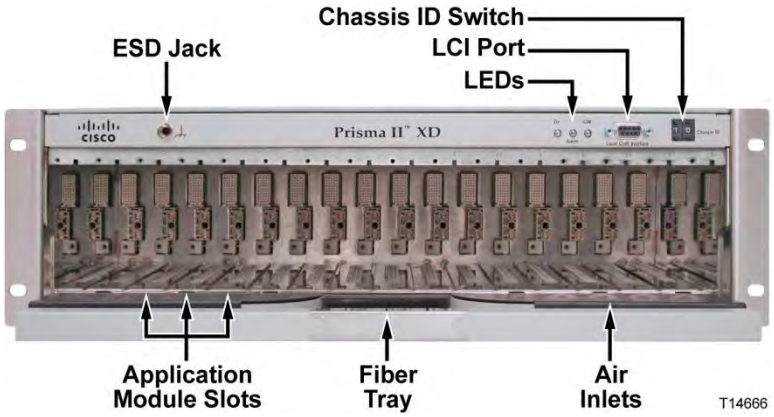
Install the Module in a XD Chassis

1. Locate the fiber tray at the bottom of the chassis and the application module slots inside the chassis as shown in the following illustration



2. Align the ridges on the top and bottom of the module with the module guide slots located on the chassis.
3. Gently slide the module into the chassis until its power and communications connections join connectors on the midplane bus. *Do not force the module into the chassis*. If properly aligned, it should slide in with minimal force.

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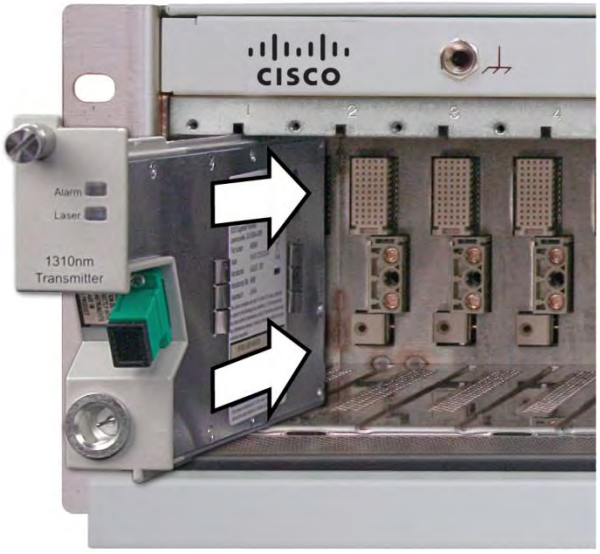
Install the Module in a XD Chassis



4. Tighten the screw at the top of the module to secure it in the chassis. Use a 3/8-in. flat-blade screwdriver to secure. *Do not over-tighten*.
5. Fill any unused chassis slots with module blanks to help ensure proper cooling air flow.

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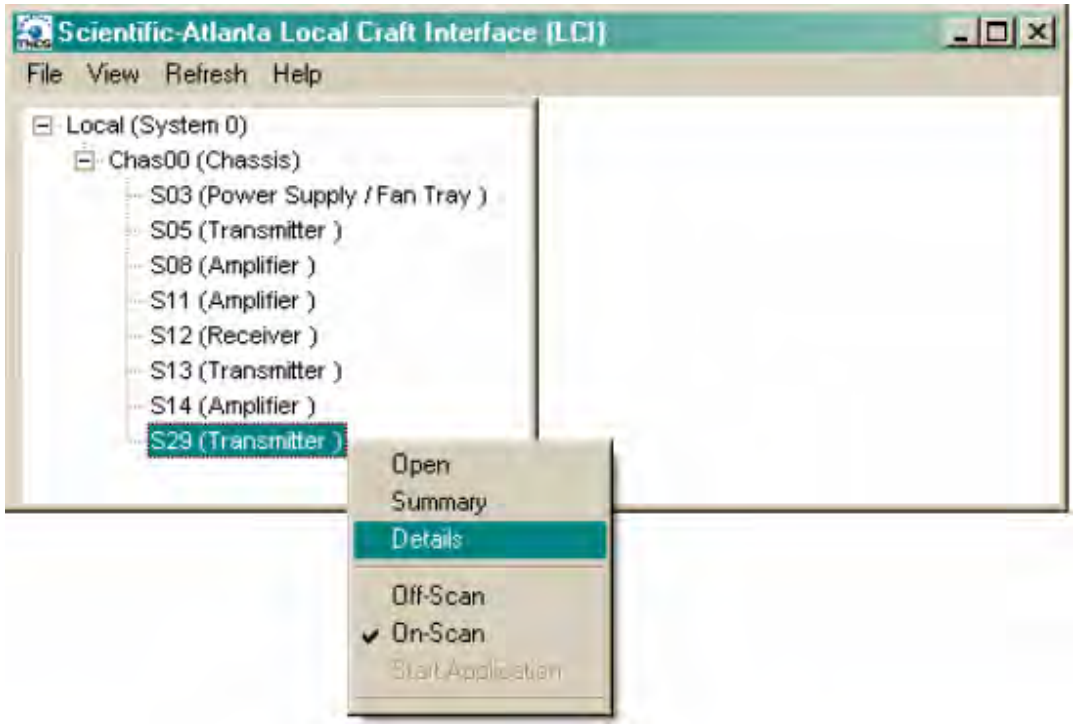
Configuring the Module using LCI

1. In the module tree, right-click the module, and then click **Details**



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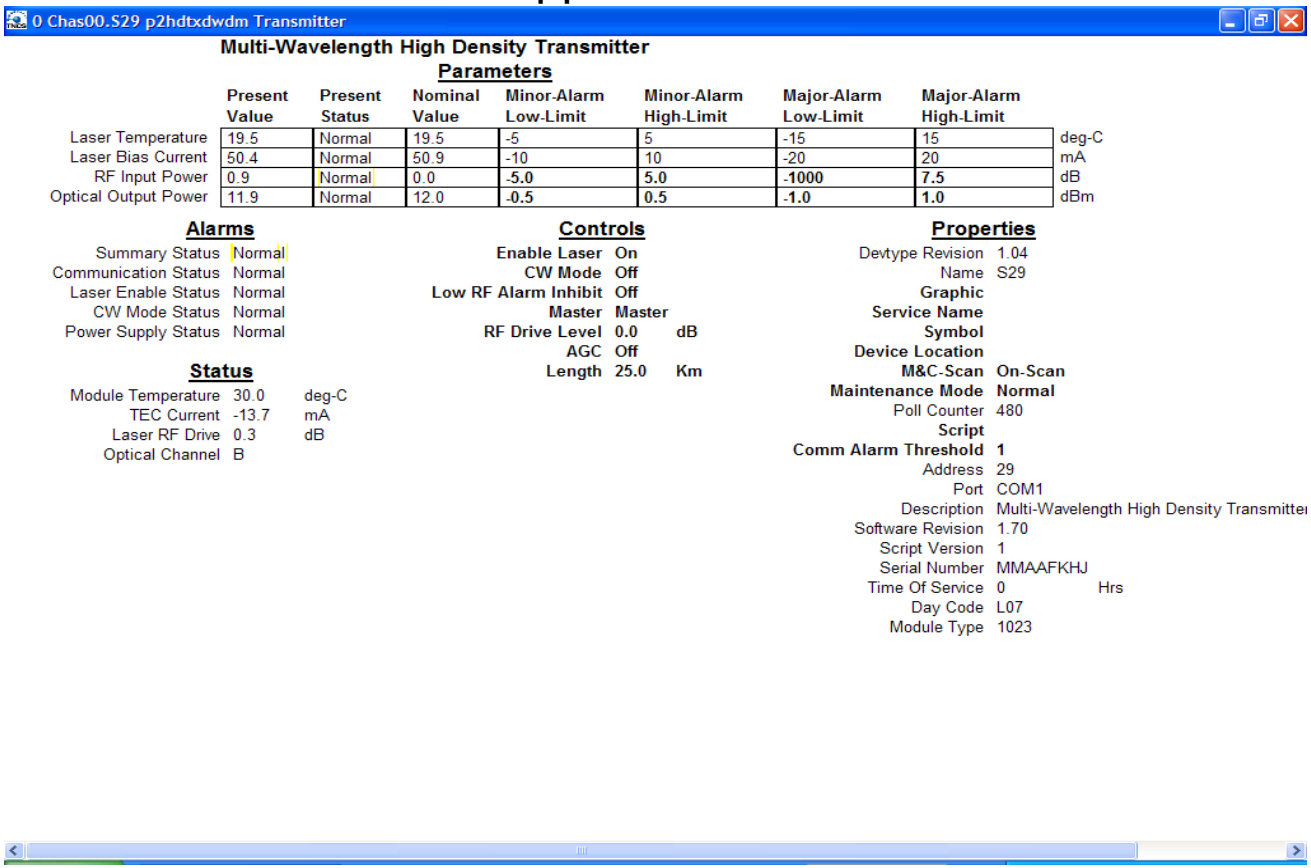
Configuring the Module using LCI

- The Module Details window appears as shown below



2. Under **Controls,** double-click the parameter you want to configure to display its Change Value dialog box. For example

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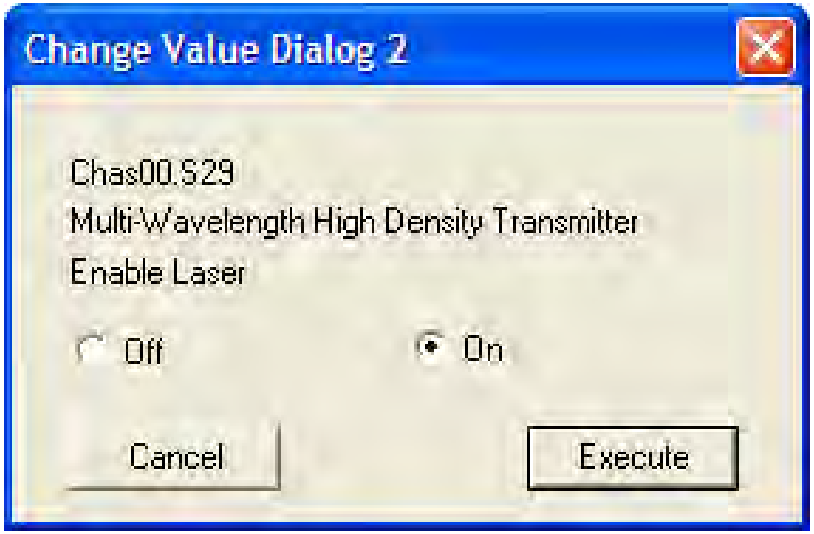
Configuring the Module using LCI

- Double-clicking the Enable Laser parameter displays the Enable Laser dialog box.



3. Depending on the parameter you chose, select or type a new value.
4. Click **Execute**. The new value appears next to the parameter

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Configurable Parameters

Parameter	Function	Values	Default
Enable Laser	Enables or disables transmitter operation, i.e., turns the laser on or off.	ON = Enabled OFF = Disabled	Enabled
Cw Mode	Automatically adjusts the displayed RF input level by subtracting 3 dB when CW mode is on.	ON OFF	OFF
Low RF Alarm Inhibit	Enables or disables the “RF input low” alarm.	ON = Alarm Enabled OFF = Alarm Disabled	Enabled
Master	Configures the module as master or slave. If set to Master, the transmitter is controlled only by the Enable control above. If set to Slave, the transmitter is controlled by a bination of Enable and the external input CNT_IN_1.	Master = ON Slave = OFF	Master
RF Drive Level	Sets the relative RF drive level into the transmitter.	-5.0 dB to +3.0 dB in 0.5 dB steps	0.0 dB
AGC	Turns automatic gain control on or off.	ON OFF	OFF
Length	Fiber link length for optimal performance	5 to 30 km in 5 km steps	Varies depending upon optical output power

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1310 Input Specifications

Bandwidth	MHz	46 - 1002	
Port-to-Port Isolation (New Media to Broadcast Inputs)	dB	> 50	
Broadcast (BC) RF Input Required RF Input Level per (NTSC) 78 NTSC analog ch's with: -320 MHz QAM (550-870 MHz) @ -6 dB -450 MHz QAM (550-1002 MHz) @ -6 dB	 dBmV dBmV dBmV dBmV dBmV dBmV	 15.3 15.0	1
Narrowcast (NC) RF Input Required RF Input Level per (QAM) -for QAM @ -6 dBc relative to analog ch's Required RF Input Level per (analog) - for equal amplitude analog ch's (BC and NC)	 dB dB	 +6 +12 *(above Broadcast RF analog level)*	2
Power Consumption (maximum)		7.5	
Front Panel Test Point Relative to Input	 dB dB	 Broadcast Input -20 ± 0.5 @ Narrowcast Input -32 ± 0.5@	

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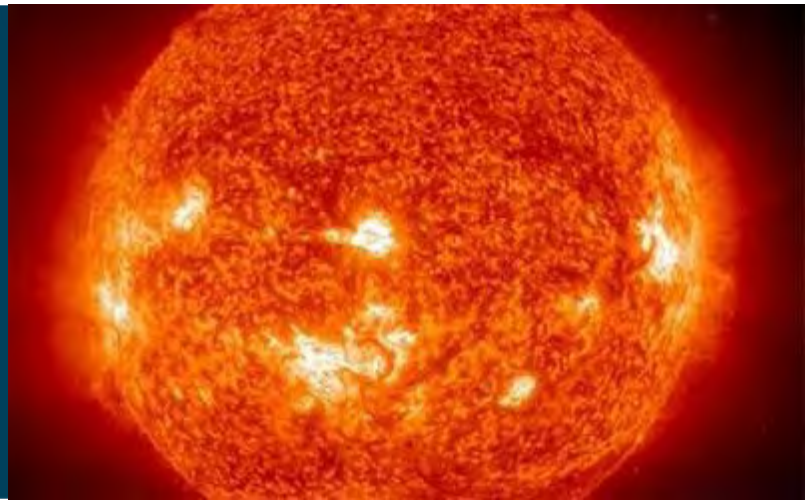
Prisma EDFA



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Prisma II EDFAs

- Prisma II Optical Amplifiers offer a wide range of configurations and output powers for architectural flexibility.
- Erbium-doped fiber amplifier modules are available in two categories: Broadcast and Narrowcast Gain-Flattened.
- Broadcast EDFAs are typically used for the amplification of broadcast signals which are carried by a single optical channel anywhere between 1530 nm and 1565 nm
- Narrowcast Gain Flattened EDFAs are designed for use in multiple wavelength systems. This highly versatile EDFA maximizes system performance and flexibility by providing constant gain control while maintaining gain flatness for up to 40 wavelengths

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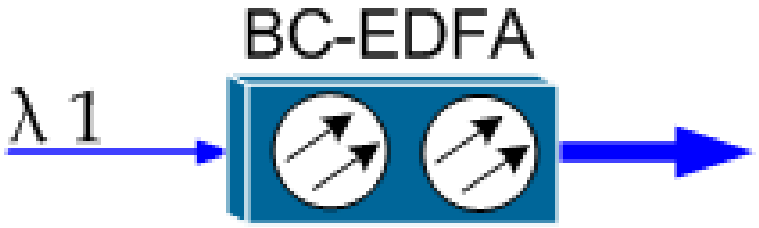
Prisma II Broadcast EDFAs

Broadcast EDFAs are typically used for the amplification of broadcast signals which are carried by a single optical channel anywhere between 1530 nm and 1565 nm



- The Prisma II Optical Amplifiers are available as Pre-Amplifier, Post-Amplifier, Hybrid Amplifier, and Gain-Flattened Amplifier (EDFA) modules.
- Many output power and port configuration options are available
  - Single output from 13dBm to 24dBm
  - Mulitport output from 2x17dBm to 24x19dBm

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Erbium-Doped Fiber Amplifier

- Narrowcast Gain Flattened EDFAs are designed for use in multiple wavelength systems. This highly versatile EDFA maximizes system performance and flexibility by providing constant gain control while maintaining gain flatness for up to 40 wavelengths.

- The Prisma II (Full Height) gain-flattened amplifier is available at 17 & 20dBm max composite output power levels.
- The new high density GF- EDFAs are available in 17 & 20dBm low and high gain

NOTE: Configuration and settings of GF-EDFA not covered in this section.

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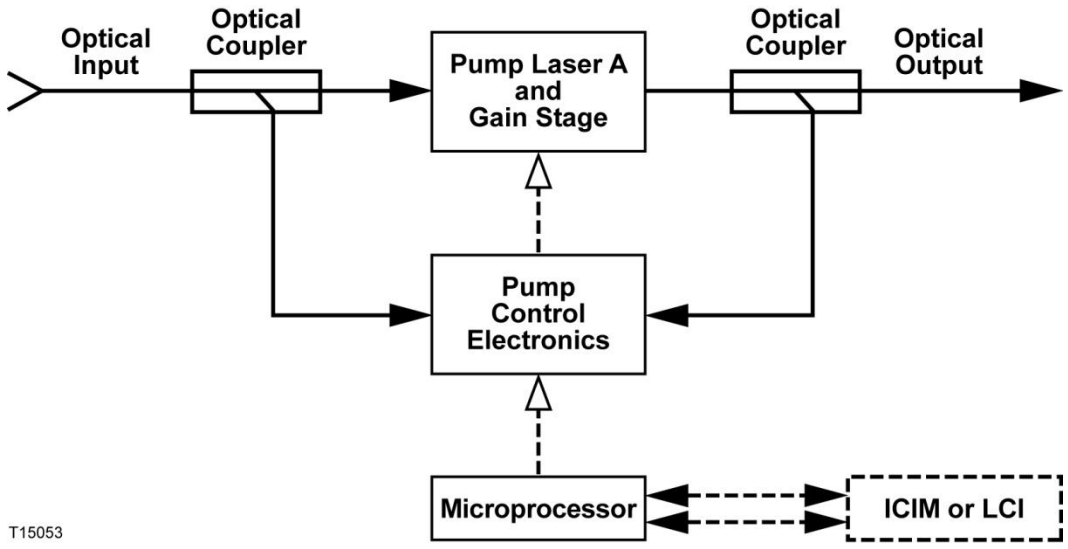
EDFA Operation

- Operating over a wide range of input powers from a TX or another EDFA, the amplifier modules provide high performance transmission of voice, video data signals for optical networking
- Depending on the system you ordered, the system may consist of a single amplifier module with 1 to 8 outputs or pre/post amp configuration with 10 to 24 outputs.



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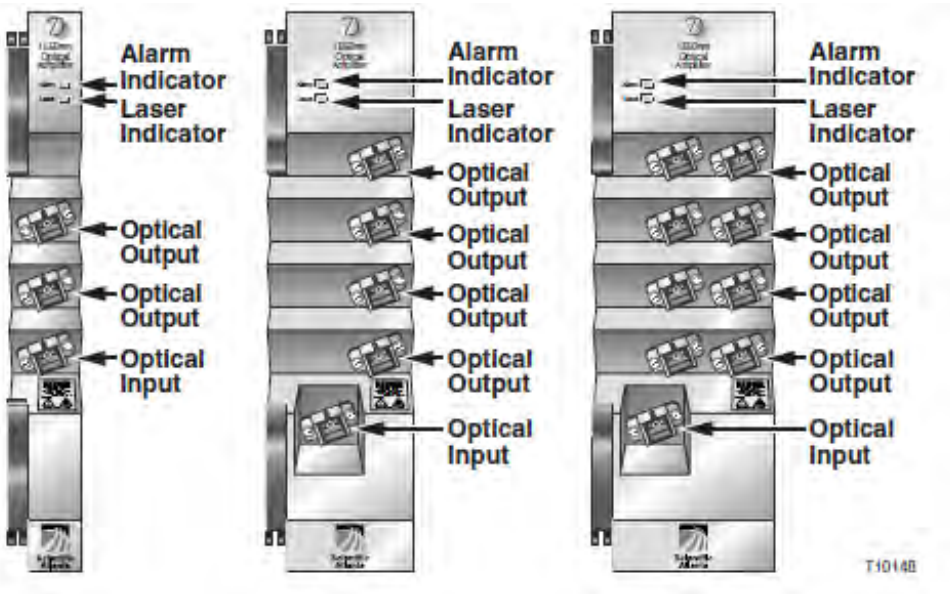
PII EDFA Front Panel

- The Prisma II Optical Amplifier front panel is designed with one input connector and one or more output connectors. ALARM and LASER indicators on the front panel allow you to monitor laser and alarm status at a glance.

Part	Function
Alarm Indicator	Illuminates or blinks when an alarm condition occurs.
Laser On Indicator	Illuminates when there is optical power present.
Optical Output	Connects the output signal to the optical cable.
Optical Input	Connects the input signal to the optical cable



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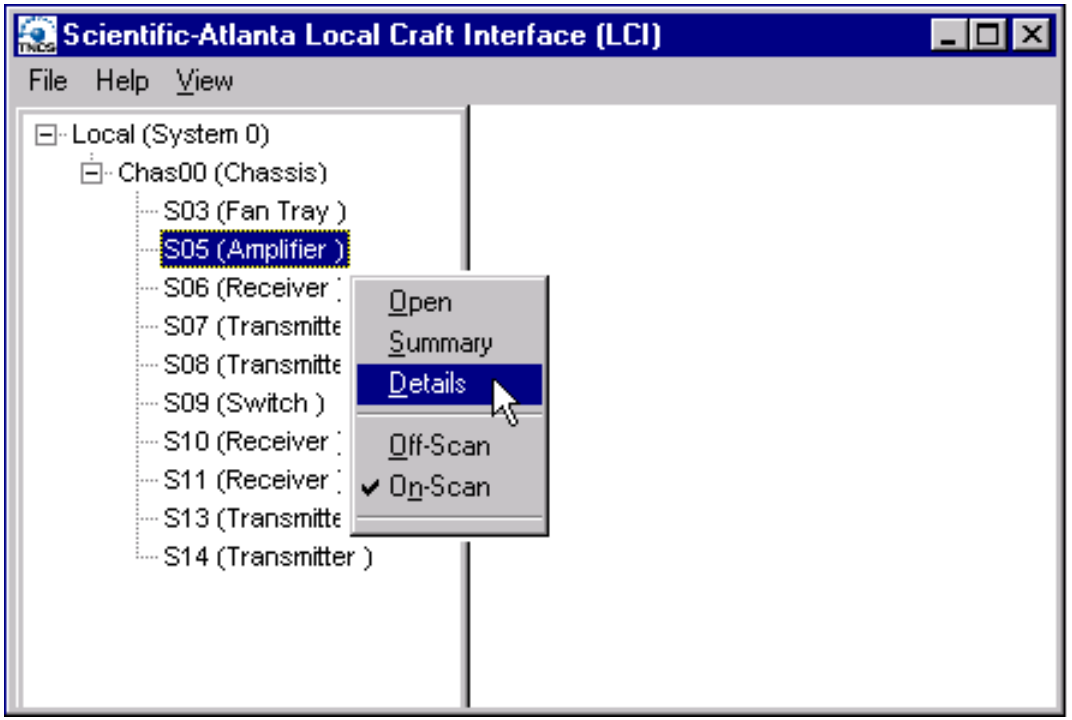
Configuring the Module using LCI

1. In the module tree, right-click the module, and then click **Details**



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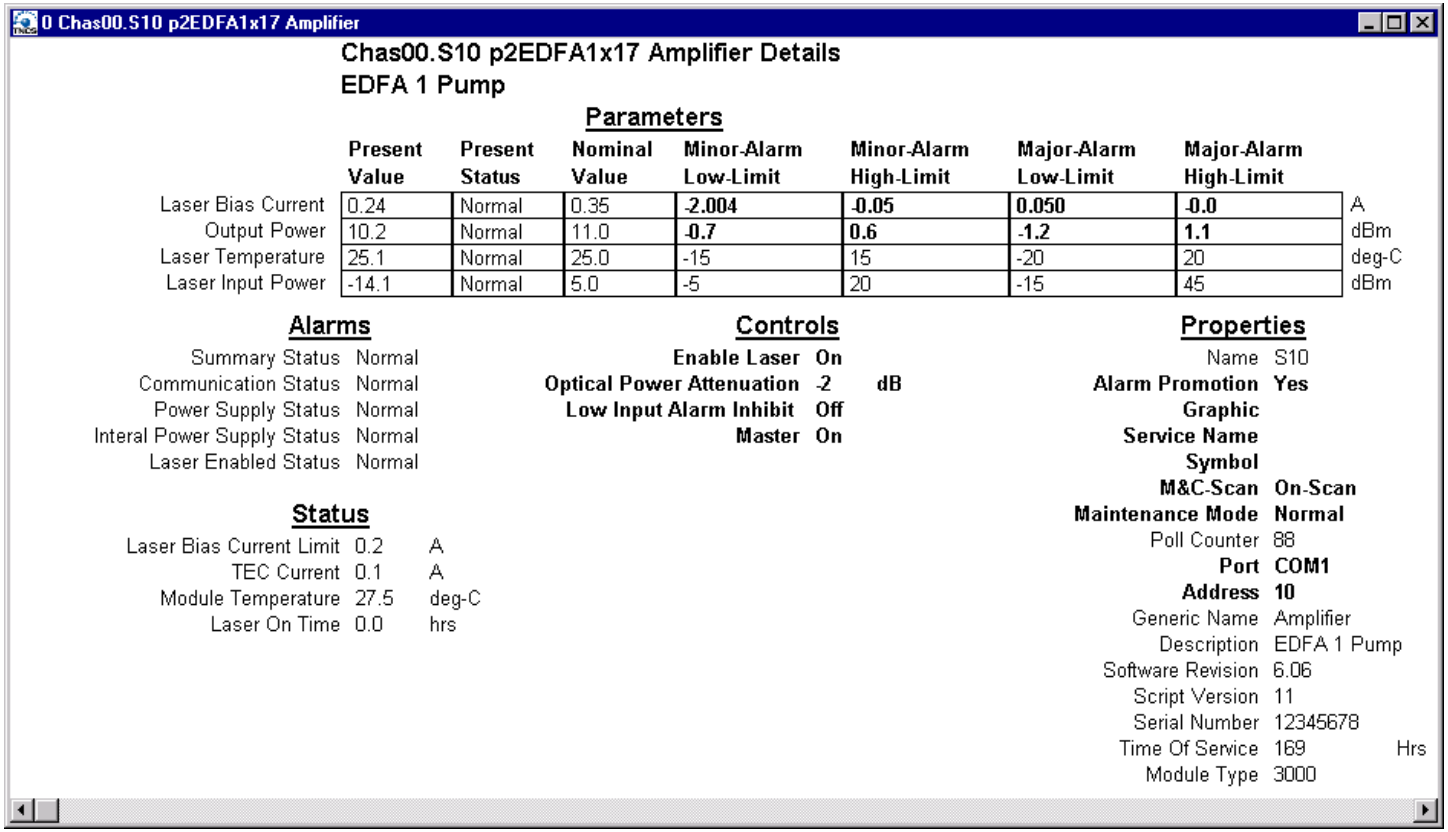
Configuring the Module using LCI

- The Module Details window appears as shown below



2. Under **Controls,** double-click the parameter you want to configure to display its Change Value dialog box. For example

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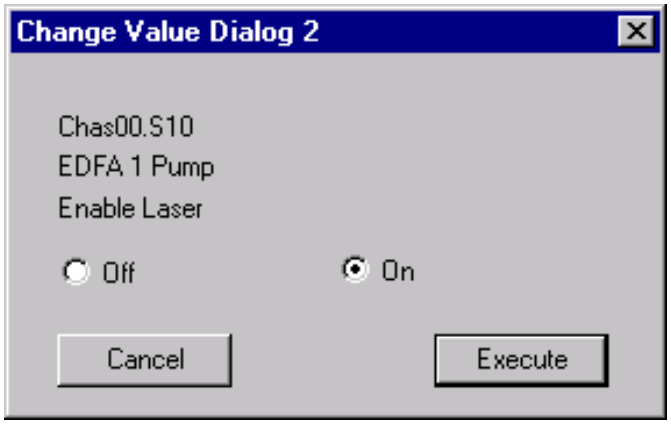
Configuring the Module using LCI

- Result: The Change Value box opens. The graphic below shows the dialog box for the Enable Laser parameter



3. Depending on the parameter you chose, select or type a new value.
4. Click **Execute**. The new value appears next to the parameter

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PII EDFA Operating Status Parameters

Parameter Name (LCI)	ICIM Abbrev.	Function	Units
Laser Input Power	InPwr	Optical input power	dBm
Output Power	OutPwr	Optical output power	dBm
Laser Temperature	LasTemp	Laser temperature	deg C
Laser Bias Current Limit	LasLim	Laser operating current limit	A
Laser Bias Current	LasBias	Laser operating current	A
TEC Current	TecCur	Thermoelectric cooler current	A
Module Temperature	ModTemp	Module temperature	deg C
Laser On Time	LaserOn	Laser in-service hours	Hrs
Enable Laser	Enable	Laser on or off	ON or OFF
Optical Power Attenuation	SetAtten	Optical power attenuation	dB
Master	Master	Master or Slave operation	ON or OFF
Low Input Alarm Inhibit	LoInpInh	Disables low input alarm	ON or OFF

Note: Not all parameters pertain to every EDFA. However, some optical amplifiers have multiple lasers and so have multiple laser temperatures, limits, bias, and so on.

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PII EDFA Configurable Parameters

Parameter Name (LCI)	ICIM Abbrev.	Function	Values	Default
Enable Laser	Enable	Turns optical amplifier on or off.	ON (Enabled) or OFF (Disabled)	ON (Enabled)
Optical Power Attenuation	SetAtten	Optical power attenuation.	1x13, 1x16, 1x17 EDFAs only. 0 dB to 3.0 dB in 0.5 dB steps	0 dB
Master	Master	Selects Master or Slave mode operation. When set to Slave, module only starts with an external alarm signal.	ON (Master) or OFF (Slave)	ON (Master)
Low Input Alarm Inhibit	LoInpInh	Disables low input alarm.	ON (Alarm Enabled) or OFF (Alarm Disabled)	ON (Alarm Enabled)

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Prisma DPON (RFOG)

David Kirkpatrick
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Creating a Versatile RFoG Solution

- Why has HFC been so successful? Versatility!
- What does an RFoG solution need to be versatile?
  - Support migration to DOCSIS 3.0 upstream four 64 QAM channel bonding (modem min/max +51dBmV)
  - Enable transition to multiple DOCSIS devices, such as True2Way® DSG devices (10-15dB loss)
  - Mirror FSAN & IEEE PON link budgets; for future needs (28dB @ 1310nm & 26dB @ 1610nm)
  - Simple system installation (plug & play)
- Key factor for all of these RFoG considerations is the system upstream dynamic range

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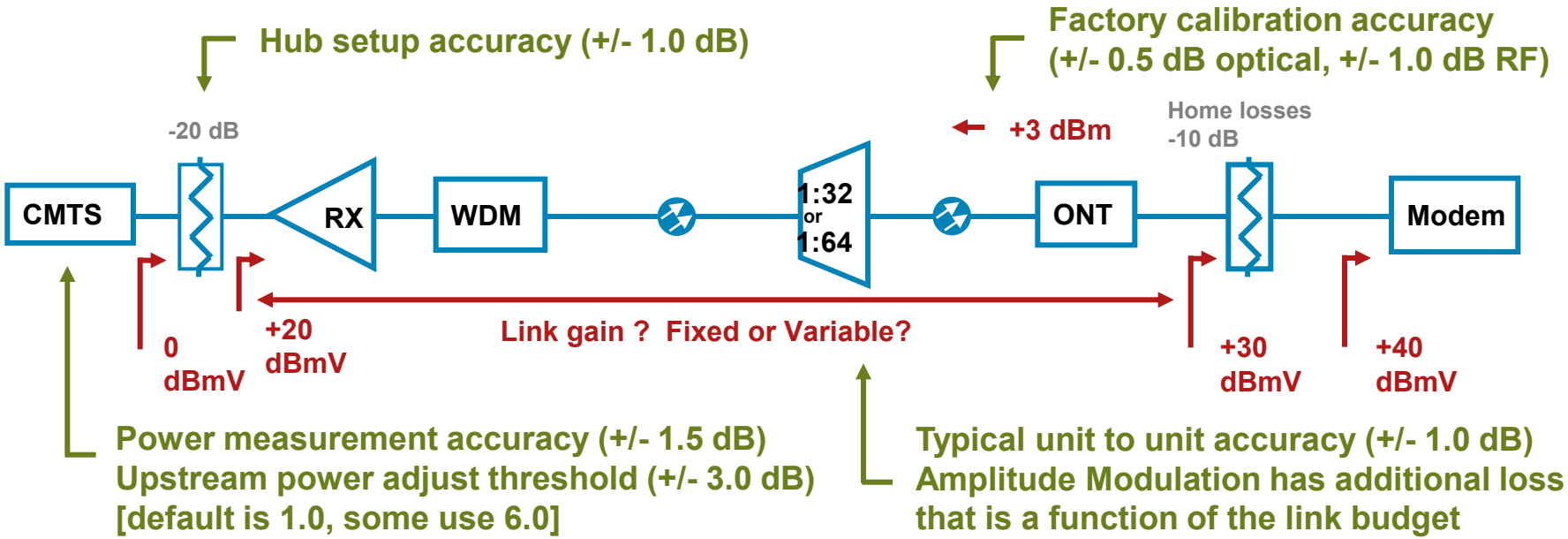
Upstream Dynamic Range

R-ONU (ONT) acceptable input range



Minimum upstream dynamic range:

+/- 3.0 dB	CMTS power adjust
+/- 1.5 dB	CMTS accuracy
+/- 1.0 dB	ONT optical output accuracy
+/- 1.0 dB	ONT link gain
+/- 1.0 dB	Hub setup accuracy
+/- 7.5 dB	= 15 dB minimum

>15 dB minimum desirable dynamic range using any frequency plan

Likely additional dynamic range contributors:

- Link loss variation
  - 2 dB RF for 1 dB optical in Amplitude Modulation (not an issue with Digital or Frequency Modulation)
- Temperature effects on laser OMI
- Future additional loading (full 5-42 MHz)

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Technology Considerations

Achieve >15 dB upstream dynamic range with DOCSIS 3.0 loading

- Amplitude Modulation (AM)
  - Existing HFC receivers have limited performance
  - New low-noise AM technology produces 23dB link budget at best
  - “Variable” link gain
- Digital
  - Can achieve 28dB link budget
  - “Fixed” link gain
  - However, costly approach
- Frequency Modulation (FM)
  - Can achieve 28dB link budget
  - “Fixed” link gain
  - Simple installation (plug & play)

Cisco investigated all reverse technologies listed.

Cisco selected the FM approach since this was the only technology that cost-effectively achieved the desired system performance.

Cisco called FM return “Wideband”

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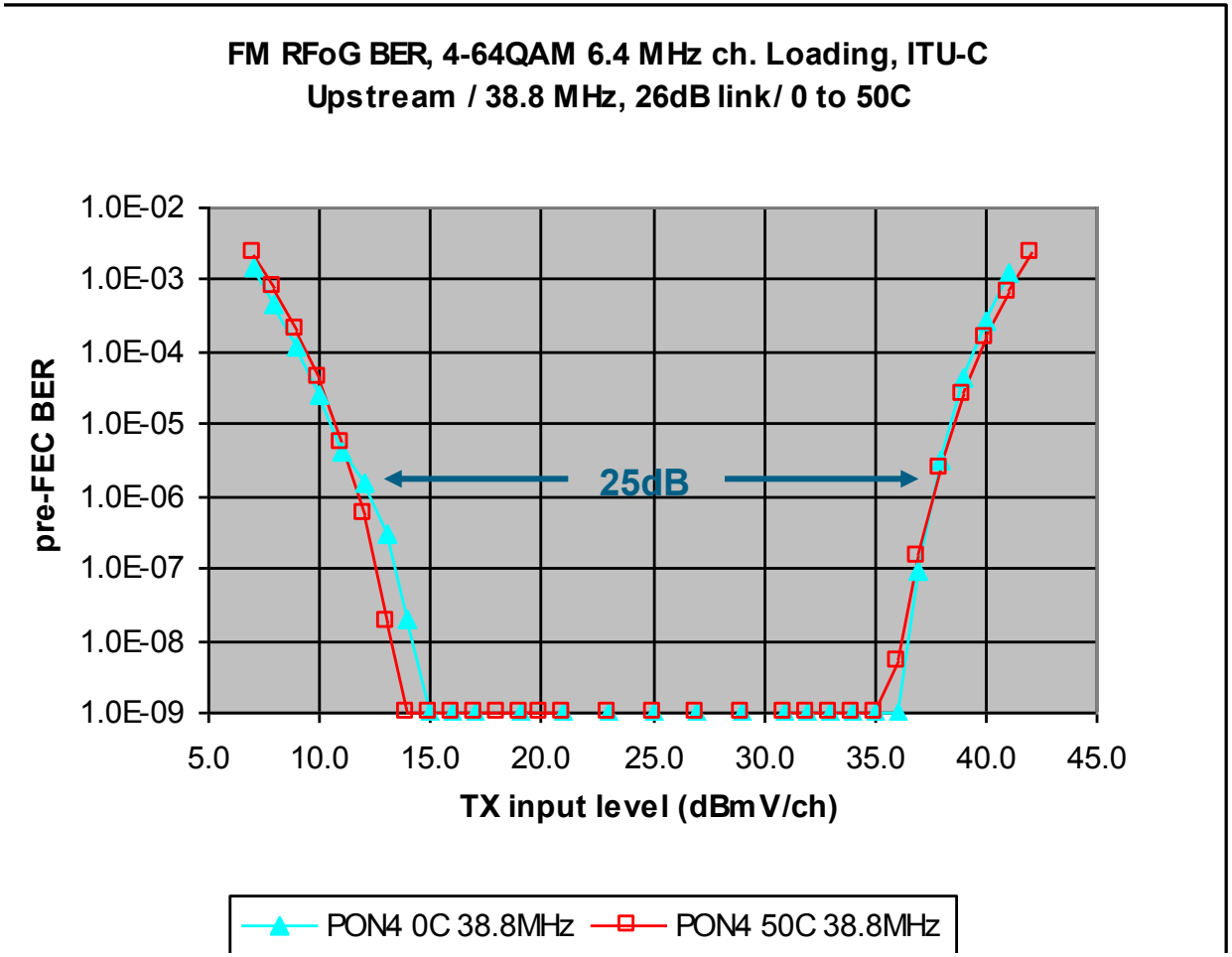
FM Technology Upstream Performance



Cisco Wideband Solution Produces >25dB Dynamic Range at 1.0E-06

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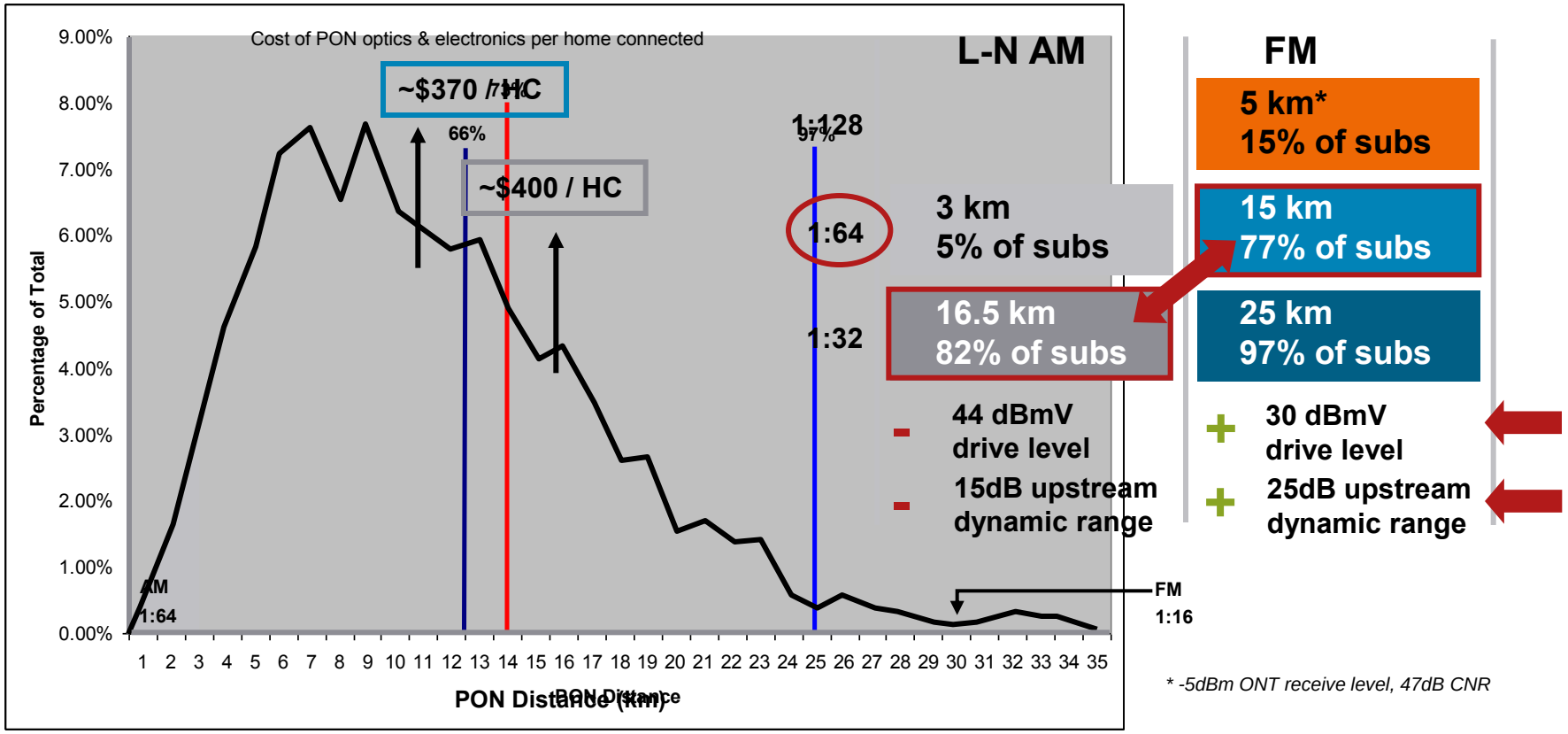
Benefit of FM Rx Technology

Subscriber distances based on 3000+ nodes from three major markets



- FM approach reduces Headend optics & rack unit requirement by 50% for approximately the same outside plant distance as AM
- FM approach enables further reach & more splits (as high as 1:128)

Note: Four bonded 64 QAM 6.4MHz upstream channel loading, all OSP assumptions are constant between split ratios and Rx technology, 1 GHz downstream loading with 48dB CNR

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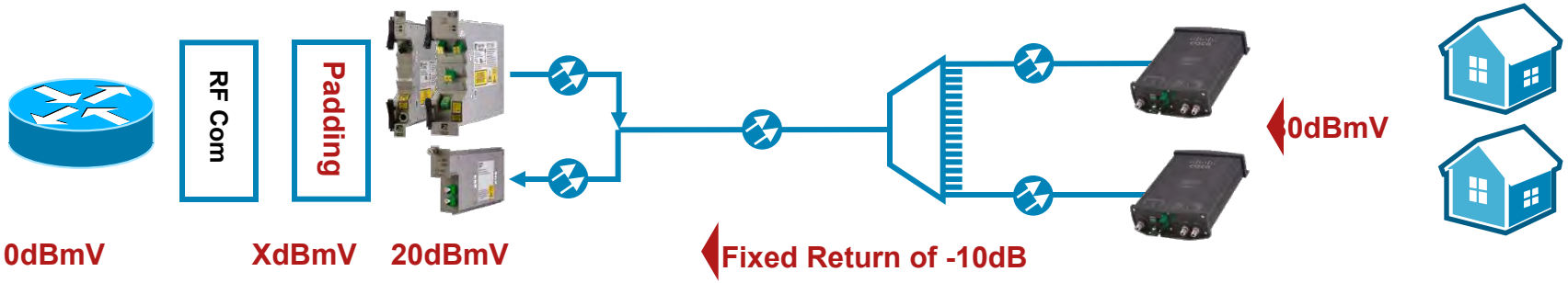
Benefit of FM Rx Technology

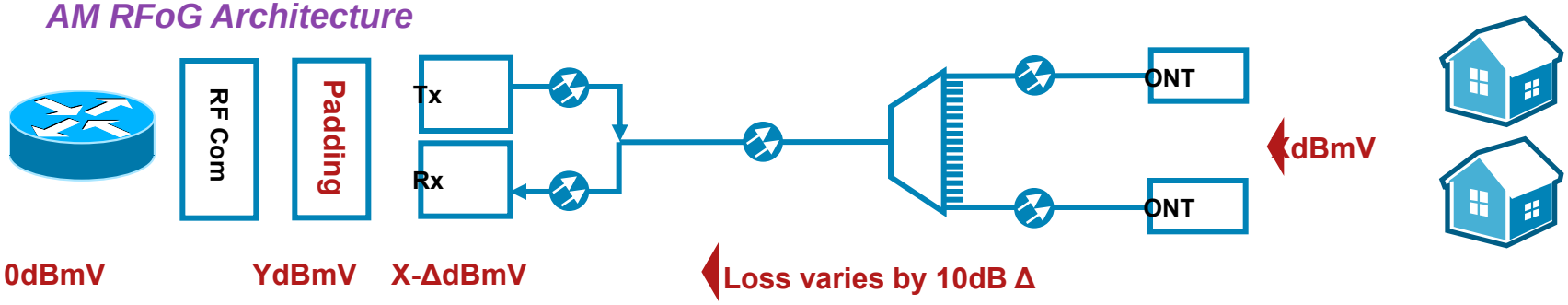
Cisco Wideband (FM) D-PON Solution Has Plug & Play Installation

Prisma D-PON Architecture



- Wideband solution has fixed gain in the return; therefore, every PON Rx is padded with the exact same level

AM RFoG Architecture



- AM Rx solutions have different loss levels for each PON return; therefore, the system requires complicated PON load balancing for each PON (every PON unique)
- AM RX solutions will require periodic rebalancing

Cisco Wideband Solution Enables Simplified System Installation

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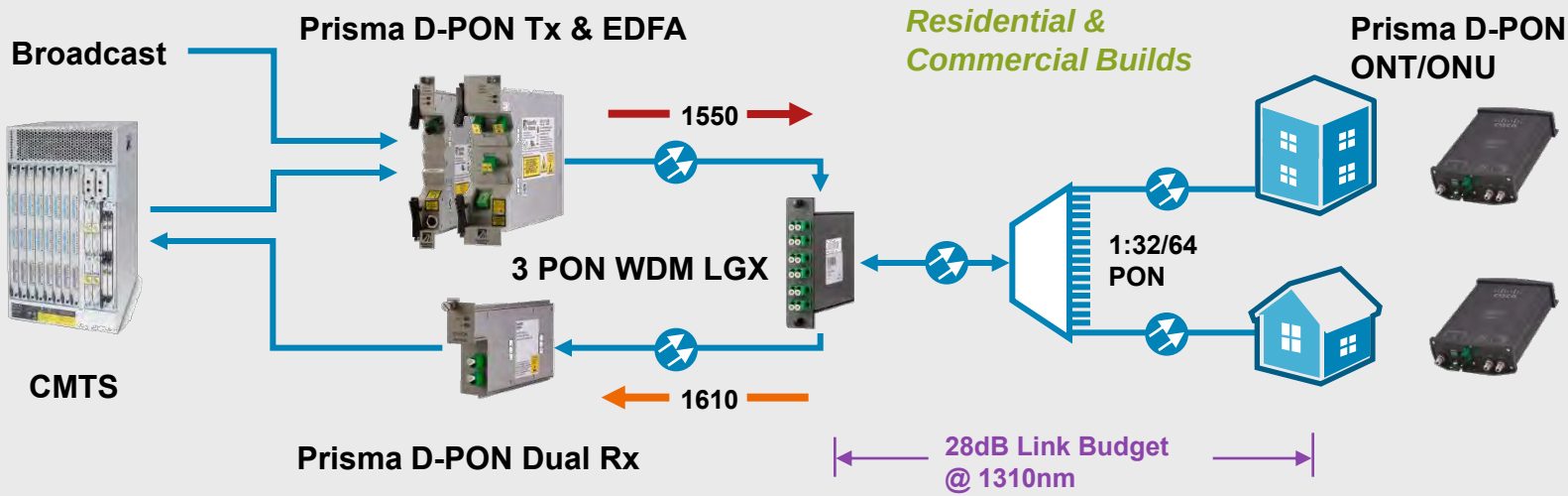
Prisma D-PON System

Prisma D-PON System with Wideband Reverse Technology



1. DOCSIS 3.0 four channel US bonding
2. Multiple DOCSIS devices
3. 28dB link budget (same as FSAN & IEEE)
4. λ compatibility with existing & future PONs

5. 1GHz 1550 Tx (78 analog & 75 QAM)
6. 48dB CNR at the subscriber

D-PON Enables Transition from HFC to RFoG to DOCSIS 3.0 & xPON

power chassis

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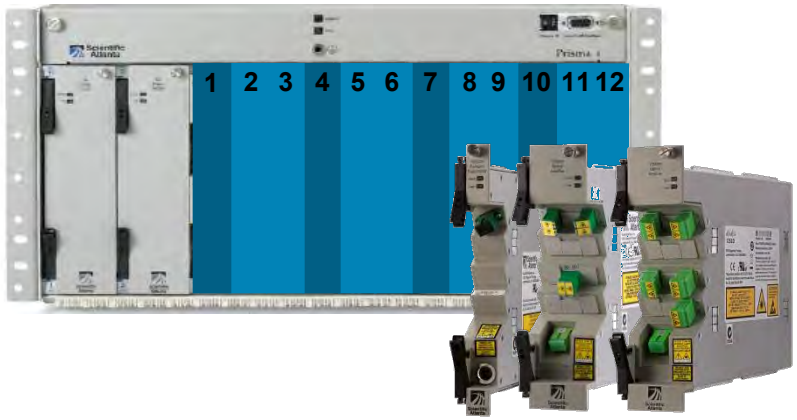
Prisma II with D-PON Optics Modules



Prisma II Chassis

- Lowest power consumption in Industry: 15 Watts max per slot
- Element management through ICIM, EMS Network Management Software
- All metal construction results in extremely rigid chassis frame

D-PON Forward Optics Modules

- 1 wide 1550nm 1 GHz Tx module
- 2 wide 4x21.5dBm EDFA module
- 2 wide 8x21.5dBm EDFA module

D-PON Wideband Rx Module

- Largest upstream dynamic range in the industry
- Supports DOCSIS 3.0 loading over FSAN & IEEE optical link budgets
- Only RFoG solution with fixed gain in the return (-10dB)
- FM Rx muting (no CNR hit for RF combining PONs)

Proven, Scalable 1 GHz FTTH Transport to Small Service Groups

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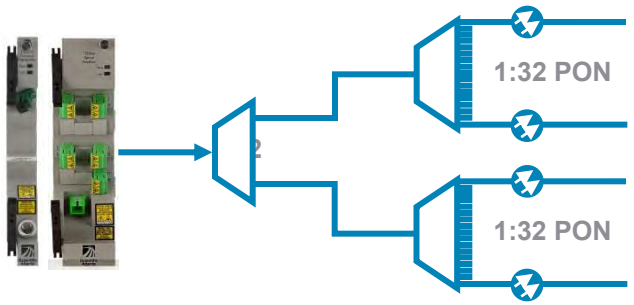
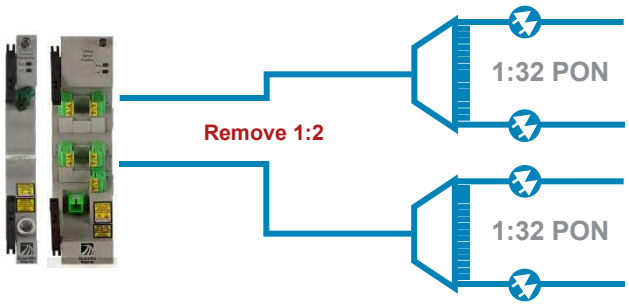
Prisma D-PON Service Group Migration

512 Home Service Group Configuration



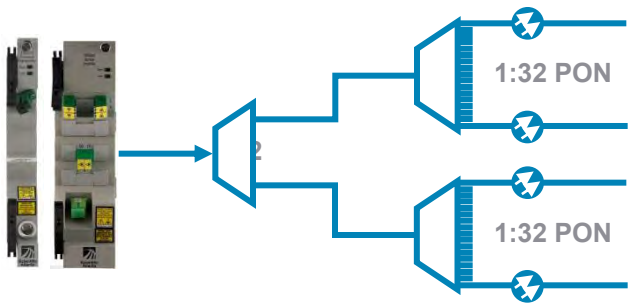
256 Home Service Group Configuration

x2



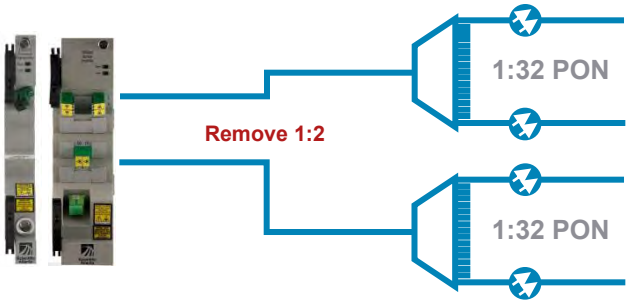
256 Home Service Group Configuration

x2



128 Home Service Group Configuration

x4



Prisma D-PON Modules Enable "Virtual Node Splits"; 26dB Link Budget Enables 1:64 Home Passed PON

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Prisma D-PON WDM LGX Module

- Highest density & lowest loss RFoG WDM
  - Triple BWDM high-density LGX configuration serves three independent PONs per module
  - Consistent performance & low insertion loss
- Combines up to four wavelengths
  - 1550nm forward RF optics
  - 1610nm reverse RF optics (SCTE wavelength)
  - 1490nm forward xPON optics
  - 1310nm reverse xPON optics
- Two BWDM versions:
  - D-PON only (two wavelength option)
  - D-PON & xPON (four wavelength option)
- Other passives
  - Multiple split ratios for couplers/splitters available in both LGX and 1RU rack mount modules

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Prisma D-PON ONT (R-ONU)

- Prisma D-PON R-ONU has three powering options
  - DC jack
  - F connector (DC)
  - DC twisted pair
- >15dBmV RF output
- Pass through filter can be added to the optional fiber management tray to support overlay with existing & future FSAN & IEEE PONs (shown far right)
- Anti-babble & excessive RF input protection

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